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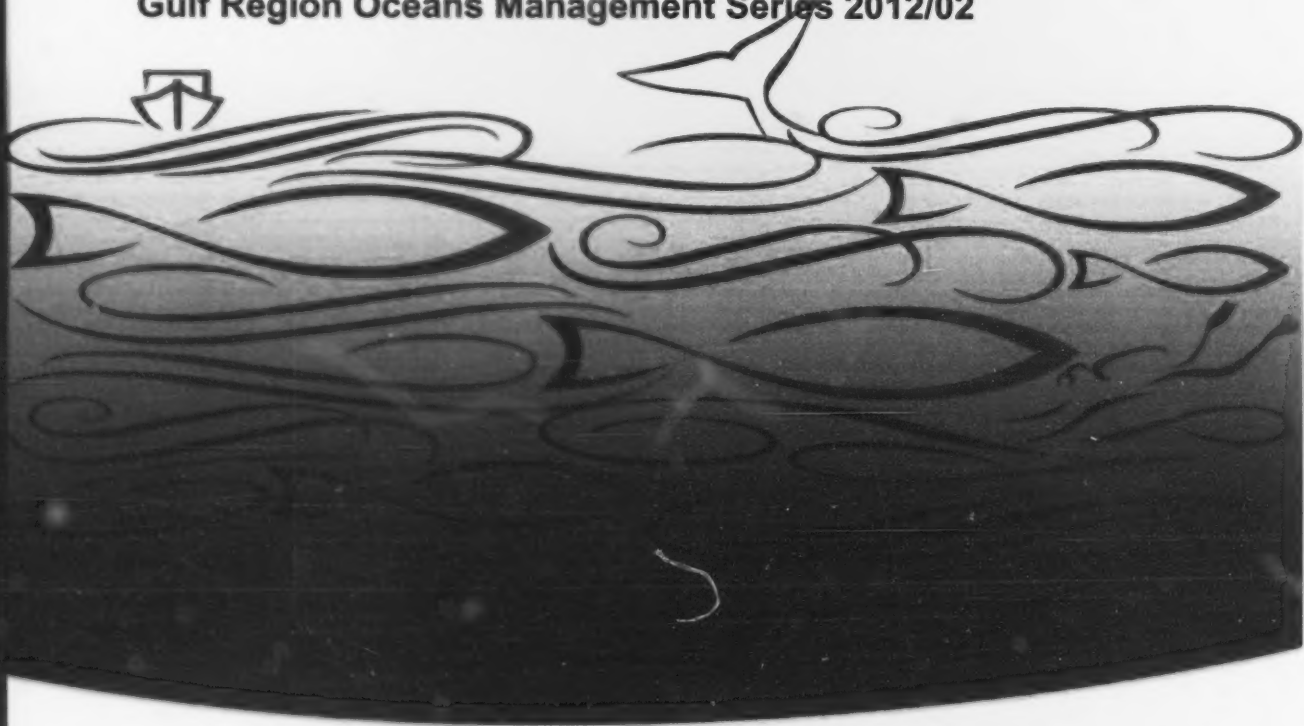
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Toward Understanding and Addressing Key Issues Facing Striped Bass (*Morone saxatilis*) in the Southern Gulf of St. Lawrence (sGSL)

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Gulf Region Oceans Management Series 2012/02



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TOWARD UNDERSTANDING AND ADDRESSING KEY ISSUES FACING STRIPED BASS
(*MORONE SAXATILIS*) IN THE SOUTHERN GULF OF ST. LAWRENCE (SGSL)

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ABSTRACT

Bath and Associates. 2012. Toward understanding and addressing key issues facing Striped Bass (*Morone saxatilis*) in the southern Gulf of St. Lawrence (sGSL). Gulf Reg. Oceans Mgmt. Ser. 2012/02: iv + 51 p.

In order to complete the Allowable Harm Assessment on Striped Bass, Gulf of St. Lawrence (sGSL) population, data was collected through questionnaires. The goal was to collect data on by-catch numbers in aboriginal and coastal fisheries (recreational, commercial and illegal). This study intended to increase understanding on the various fisheries mortality impact on Striped Bass. This report provides the results to better understand mortality rates of Striped Bass, presents the results of a human dimension facilitated focus group workshop which was organized with a number of questionnaire respondents, and summarizes the challenges of the questionnaire delivery, design and potential further data analyses. Results show that medium sized Striped Bass are the most common individuals to be caught and released dead. Illegal and recreational fishing activities seem to be responsible for the death of the majority of adult Striped Bass. Further to this it is acknowledged that commercial gaspereau, Rainbow Smelt, Atlantic Herring, American Shad fisheries and Aboriginal Food, Social and Ceremonial fishery for Atlantic Salmon all have significant impacts on Striped Bass losses whereas American eel and Atlantic Silverside fisheries have minimal impacts.

RÉSUMÉ

En vue de terminer l'évaluation des dommages admissibles sur la population du bar rayé, population du golfe du Saint-Laurent, des données ont été recueillies par l'entremise de questionnaires. Le but était de recueillir des données sur les prises accessoires pour ce qui est de la pêche autochtone et de la pêche côtière (récréative, commerciale et illégale). Cette étude vise à accroître la compréhension des répercussions de la mortalité découlant de différents types de pêche sur le bar rayé. Ce rapport fournit des résultats qui permettent de mieux comprendre les taux de mortalité du bar rayé et présente les résultats de l'atelier d'un groupe de discussion fondé sur une dimension humaine, mis en œuvre à l'aide d'un certain nombre de répondants aux questionnaires. De plus, le rapport résume les défis liés à la livraison, à la conception et au potentiel d'autres analyses des données du questionnaire. Les résultats démontrent que le bar rayé de taille moyenne est l'individu le plus souvent capturé et remis à l'eau mort. Les activités de pêche récréative et illégale semblent responsables de la mort de la majorité des bars rayés adultes. La pêche commerciale du gaspereau, de l'éperlan arc-en-ciel, du hareng de l'Atlantique et de l'aloise savoureuse et la pêche du saumon de l'Atlantique par les Autochtones à des fins alimentaires, sociales et rituelles ont des répercussions sur les baisses de population du bar rayé, tandis que la pêche à l'anguille d'Amérique et la pêche à la capucette ont de légères répercussions.

1. INTRODUCTION

Striped Bass were once commercially important and remain highly prized by anglers and First Nation groups. Because of a decline in the populations, management measures for Striped Bass have been put in place to ensure its protection since 1992. The commercial fishery for Striped Bass was closed in 1996 and the recreational and Aboriginal fisheries were closed in 2000. The southern Gulf of St. Lawrence (sGSL) population of Striped Bass was assessed as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in November 2004 (COSEWIC 2004). As a result of this assessment, Fisheries and Oceans Canada (DFO), the responsible jurisdiction for aquatic species at risk under the Species at Risk Act (SARA, Canada 2002), is required to undertake a number of actions prior to issuing recommendations on listing the species on the SARA.

For species assessed as endangered or threatened by COSEWIC DFO prepares a Recovery Potential Assessment (RPA) to provide formal scientific advice on recovery feasibility, potential measures to address identified threats, and to provide advice on the types of activities that can potentially be permitted under SARA. In 2006, a RPA for sGSL Striped Bass was prepared to provide scientific information to support different recovery scenarios (Fisheries and Oceans Canada 2006). The RPA for sGSL Striped Bass evaluated whether the survival or recovery of the species was compromised by impacts of existing activities and whether recovery could be improved by reducing mortality. Of particular interest was mortality that was associated with fishing activities (illegal harvest as well as by-catch in legal fisheries). Due to a lack of quantitative information, the RPA only provided a qualitative description of the expected effects of the identified threats. The RPA also provided examples of measures to be considered to reduce this expected mortality.

This study is an effort to gain a better understanding of the human dimension and qualitative data aspects related to the various fisheries mortality impact on Striped Bass. To complete this project, expertise in public involvement mechanisms, survey design and analysis (using qualitative and mixed methodologies) and knowledge of natural resource management were required. Social science expertise was sought outside of the department and *Bath and Associates* was selected based on experience with human dimension factors research. *Bath and Associates* have conducted extensive research on resource management and public involvement in resource management decision-making. Past experiences include completion of projects focused on public attitudes towards species at risk in Newfoundland and Labrador (NL) and community engagement projects on recreational salmon fishery issues in NL. In addition, *Bath and Associates* have been involved in numerous national and international opinion surveys on wildlife management.

SARA Section 73 provides the legal authority to issue a permit to a person, authorizing the person to engage in an activity affecting a listed wildlife

species, any part of its critical habitat or the residences of its individuals. Permits may only be issued when a number of conditions are met such that affecting the species is incidental to the carrying out of the activity. SARA Section 83(4) provides for activities to which the prohibitions of SARA could be excluded. The SARA provisions of "no jeopardy to survival or recovery" are also known as "allowable harm". The 2006 RPA did not give advice on allowable harm. Since such advice is needed to aid DFO in complying with SARA, results of the present study are considered complementary to advice provided in the 2006 RPA (Fisheries and Oceans Canada 2006).

In order to complete the allowable harm assessment, two questionnaires were created by DFO to collect information on fishing practices and activities which could potentially affect Striped Bass. The objective was to gather information on current aboriginal and coastal fisheries (recreational and commercial) as well as the extent of illegal fisheries and the proportion of Striped Bass by-catch in these fisheries.

The questionnaires allowed participants to offer detailed information including the location of the fishing activities, fishing seasons, gear type, average number of Striped Bass captured in a year, the size of Striped Bass captured, and the condition and fate of the fish captured. The fishing activities identified in the questionnaires were Aboriginal Atlantic Salmon food, social and ceremonial (FSC) fishery (gillnets and trap nets only), tidal and marine water recreational fisheries, illegal fisheries, and commercial Gaspereau, Rainbow Smelt, American Eel, Atlantic Herring, American Shad, and Atlantic Silverside fisheries in the Gulf Region. Aboriginal fisheries coordinators, Aboriginal fishers/elders, Conservation and Protection (C&P) personnel and selected fishers participated in the study in an effort to gain a broad description of the fisheries and an assessment of their impacts on Striped Bass. The present study used the results of the questionnaire responses to estimate Striped Bass mortality rates in each fishery.

The objectives of this report are as follows:

- To present the results of quantitative questionnaires developed and administered by DFO on by-catch of Striped Bass in the southern Gulf of St. Lawrence;
- To present the results of a focus group discussion which included individuals who had completed the questionnaires and/or were familiar with the Striped Bass;
- To discuss challenges associated with the data collection methodology and questionnaires design, and how results based upon the questionnaires might be appropriately presented.

2. INTERNAL DFO DEVELOPMENT PROCESS FOR QUESTIONNAIRES USED IN STUDY

It is understood that a number of coastal fisheries incidentally capture Striped Bass in sGSL, and that this by-catch could have an effect on the survival and recovery of the species. Thus, the primary goal of DFO's questionnaires was to determine how many Striped Bass are incidentally caught in specific coastal fisheries and how many survive. The study was based on two questionnaires (an aboriginal fisheries questionnaire and a non-aboriginal coastal fisheries questionnaire) designed through discussions with individuals within the Science Branch. Further information about the questionnaires, data sampling, data collection and specific wording of items is offered below.

2.1. QUESTIONNAIRE DESIGN, DATA COLLECTION, AND IMPLEMENTATION

Pre-testing of both questionnaires was conducted with individuals from within DFO. Comments and suggestions from DFO staff were used to improve readability and ease of use of the questionnaire by participants.

2.1.1. *Sampling procedures*

Respondents were selected based upon their expertise (in terms of knowledge), primarily linked to their supervision of the fisheries or participation in the fishery itself. Non-random sampling was done according to the roles and functions of the individual and geographic location. Respondents were chosen using a "snowball"² method. Snowball methodology uses an iterative process to identify subject matter experts. The process is commenced whereby the first respondents are selected, in this case the immediate partners of the research (Conservation and Protection Branch members). These respondents identify colleagues or fishers, whom they respect, trust, and recognize for their expertise and recommend them as potential respondents. As a result, respondents were identified as people who had direct ties to the fishing industry and were considered to be reliable sources of information.

2.1.2. *Aboriginal fisheries questionnaire*

A semi-structured questionnaire (Appendix A) was used to gather information on the by-catch component of Striped Bass in Aboriginal Food, Social and Ceremonial Salmon fishery that uses gillnets and trap-nets. Prior to contacting the Aboriginal communities, a list was compiled of First Nations currently utilizing trap nets and gillnets for their Food, Social and Ceremonial Atlantic Salmon fishery. A total of seven First Nation communities were identified in the Gulf Region. A letter, signed by the Gulf Regional Director General, was

² Snowball sampling is a technique used in social sciences where an initial core of influential participants is asked to refer other participants in relation to known expertise in the subject matter of the study (Beaud 2009).

sent to the Chief and Council as well as the fishery coordinators to advise them of the study and its purpose.

This questionnaire was administered to a group of First Nation's fisheries coordinators through DFO Aboriginal Program Coordinators located in DFO Area Offices. Using the snowball sampling technique identified above, fisheries coordinators were asked to identify aboriginal fishermen or elders who would participate in the questionnaire. C&P fisheries officers, familiar with the Aboriginal fishing activities, were also asked to complete this questionnaire. The questionnaire was completed in person or by telephone. The information was then compiled and formatted for later statistical analysis using Statistical Package for the Social Sciences (SPSS).

2.1.3. Non-Aboriginal coastal fisheries questionnaire

A second semi-structured questionnaire (Appendix B) was designed to gather information on Striped Bass by-catch in non-Aboriginal coastal fisheries (recreational, commercial and illegal). This questionnaire was e-mailed to supervisors of 11 Conservation and Protection detachments and 9 sub-detachments in Gulf New Brunswick (NB), Gulf Nova Scotia (NS) and Prince Edward Island (PEI). Using a "snowball" technique, supervisors identified fishery officers from their detachments to complete the questionnaire; these officers were then asked to identify local fishers who could participate in the study. The questionnaire was administered by telephone to identified local fisher respondents. The offer for follow-up telephone calls to fisheries officers where further clarification was required was made.

3. RESULTS FROM THE DFO QUESTIONNAIRES

(All figures mentioned in this section are shown in appendix D)

3.1. NUMBERS OF FISH CAUGHT BY TYPE OF FISHERY

The information gathered via questionnaires from respondents was compiled and analyzed by the consultant using Statistical Package for Social Sciences (SPSS) software. From an initial glance, there are large numbers of Striped Bass caught in the various fisheries; most of the fish are medium in size (Figure D1). These results appear consistent with the scientific knowledge shared at the Pre-COSEWIC Striped Bass meeting in Moncton, NB in early 2011 which suggested that most of the population seems to be medium in size and larger fish are rare.

The most frequent occurrences of fish caught were found to be in two categories: 1) less than 100 and 2) between 101 and 1,000. It is important though to remember that while the fish are caught as a by-catch and thus "potential harm" may exist, not all of these fish are killed. Certain fisheries have better rates of successful release of Striped Bass than others. The same pattern of medium sized fish caught is seen in the aboriginal fishery (Figure D2) and the recreational fishery (Figure D3). However, in the latter case there are nearly double the numbers of occurrences of medium-sized fish caught.

As illustrated in Figure D4, the gaspereau fishery has the potential to catch large numbers of Striped Bass of various sizes. It is important to note and further discussed later in this document that the numbers released dead are not as high as in other fisheries. While the highest accounts of Striped Bass caught in the Rainbow Smelt fishery are small in size and less than 100 (Figure D5), as mentioned earlier, this may be an underestimation as participants may not have included the young-of-the-year size class. In fact, this may be a concern due to the geographically widespread nature of the smelt fishery and the challenges associated with releasing young-of-the-year Striped Bass alive.

The American Eel fishery (Figure D6) has probably little impact on Striped Bass in its current format as a result of the small numbers of incidental catch and the high survival rates upon release. On the other hand, there seems to be a higher mortality of Striped Bass caught in the Atlantic Herring fishery compared to other directed fisheries (Figure D7). However, as a result of mesh sizes of herring gillnets, only a few large fish are caught.

Less than 100 fish were caught within the Atlantic Silverside fisheries and again they were mainly medium sized; very few were small or large (Figure D8). Such a fishery appears to pose minimal impact on the Striped Bass population. The Striped Bass by-catch in the American Shad fishery is estimated between 1,001 and 5,000 and although limited in the area and season, this fishery has the potential to impact Striped Bass. Data for the American Shad fishery is not

illustrated in a graph due to a lack of sufficient number of responses in the questionnaires. Finally, C&P officers who participated in the facilitated focus group workshop believed that illegal fishery is an issue. There are indeed Striped Bass taken and it can be assumed within the illegal fishery that all Striped Bass were killed and retained (Figure D9).

3.2. MORTALITY RATES BY FISHERY, BY NUMBERS AND BY SIZE

To understand the potential impact of a fishing activity on the survival and recovery of Striped Bass it requires an understanding of the level of by-catch from the various types of fisheries (see also Figures D1 to D 9) and the likelihood of Striped Bass being released alive once caught.

Figure D10 offers the percentage of Striped Bass released dead by type of fishery. Not all fisheries pose an equal threat to Striped Bass mortality. In fact, some fisheries, as a result of increased awareness amongst harvesters and the nature of gear type used, can be relatively successful in releasing the majority of Striped Bass caught alive. This current research assumes that all fish are killed in the illegal fishery. There is also a high mortality of large fish within the recreational fishery.

On a positive note, large numbers of fish (in the categories: 1,001-5,000, 5,001-10,000 and >10,000) seem to be released alive most of the time (Figure D11). Smaller numbers of fish (<100 and 101-1,000) are the most common to be released dead. Medium sized fish are the most common released dead (Figure D12) and this result is consistent with data on the size of fish caught. That being said, there is a fear amongst scientists that many young-of-the-year Striped Bass may be killed in the Rainbow Smelt fishery and that these fish were underreported due to the lack of a clear definition defining small fish in this study (2010 Douglas, S – pers comm.).

4. HUMAN DIMENSION FACILITATED WORKSHOP APPROACH (HDFWA) RESULTS

Nine individuals participated in an approximately three hour human dimension facilitated focus group workshop held on February 3rd, 2011. Different from traditional North American facilitation approaches which use flipchart paper, the HDFWA understands that people learn visually. Thus, a combination of colored cards and shapes to illustrate ideas and patterns of discussion was used. The approach is based on participants understanding the discussion rules, interpreting the colored cards. Participants in a HDFW can clearly recognize when there was considerable discussion on a topic, when ideas were not challenged by any groups and where consensus was reached (Appendix C). Several participants, particularly those involved in the aboriginal fishery, made specific comments regarding the advantages of such an approach. All participants were actively involved in the discussion.

After briefly introducing themselves, participants were asked if they knew why they were at the focus group workshop, whether they believed the situation was getting better or worse regarding Striped Bass and what factors made them optimistic and pessimistic about the future of the species. In addition, participants were asked about how they completed their questionnaire in order to gain further understanding about numbers of fish possibly killed or caught and released.

4.1. WHAT MAKES PARTICIPANTS PESSIMISTIC ABOUT THE CURRENT SITUATION REGARDING STRIPED BASS?

There were more pessimistic issues mentioned by focus group participants than issues making them optimistic about the current situation concerning Striped Bass. Focus group participants mentioned several issues that illustrated their thoughts that the situation regarding Striped Bass may in fact be getting worse. Individuals discussed that there seemed to be a *lack of science*; particularly, little is known on how many Striped Bass are taken illegally. Aboriginal participants highlighted that there remains a *lack of trust in traditional ecological knowledge* by government departments. Individuals did not feel that they are being effectively engaged and/or invited in some cases to discussions about Striped Bass. Focus group participants also suggested that there is a delicate *balance between making decisions and fear*. The participants believed that there is pressure from all interest groups and political pressure to open the Striped Bass fishery but it is also their opinion that there is still not enough knowledge about whether the population could sustain such a fishery.

Another issue that made participants pessimistic about the current status of Striped Bass was something they labeled the *missing link*. Individuals were concerned that no new confirmed spawning grounds had been found and that there was a lack of big numbers of fish.

Furthermore, the general public has some *disbeliefs* about Striped Bass. Focus group participants felt that there was a lot of misinformation amongst the public regarding Striped Bass. For example, some members of the public believe that Striped Bass is a nuisance fish, a fish that eats lobster, a much more valuable species.

Other issues that participants discussed during the focus group included the *lack of resources* (explained as the lack of monies to conduct scientific research on the species) and understanding the extent and implications of *by-catch waste* and *habitat destruction*, particularly on the impacts of the pulp and paper industry on fish habitat. Participants also mentioned *challenges of enforcement* and *trust issue*; C&P officers participating in the focus group stated that illegal fishing was an issue because the fish was easy to catch which created an additional law enforcement challenge. Focus group participants did discuss that recreational fishers can legally be fishing for trout in estuaries and mackerel from wharves and coasts but are able to catch Striped Bass and will retain these fish. As suggested by focus group participants, amongst all the fisheries, mortality for large fish is highest in illegal and recreational fisheries. Other fisheries of potential concern in terms of high mortality due to by-catch could include the American Herring and smelt fishery, particularly for young-of-the-year Striped Bass. The last issue mentioned by participants was specifically related to the completion of the questionnaires regarding Striped Bass. Participants at the focus group, most of whom had completed a questionnaire, described their concerns about how their answers might be used against them. This suggests that there is a lack of trust about the collection of information by DFO.

4.2. WHAT MAKES PARTICIPANTS OPTIMISTIC ABOUT THE CURRENT SITUATION REGARDING STRIPED BASS?

Focus group participants expressed that this *meeting* made them optimistic because it was an indication that somebody was concerned about Striped Bass and was willing to listen and learn from those interested in the issue. Such a comment suggests the importance of using human dimension facilitated workshops to build trust, credibility and engage interest groups. Participants also mentioned that the *population of Striped Bass appears to be going up* although, individuals were cautious about this statement. Individuals believed that *public awareness* of how to release live fish back into the water quicker is *increasing*. This would mean less mortality on fish accidentally caught. In contrast to something stated earlier as a pessimistic idea, aboriginal participants mentioned that there was better *partnerships and collaboration* occurring between government and aboriginal groups. Participants believed that there is *potential for research* on Striped Bass but this hasn't been realized as suggested earlier. It is also believed that *better water quality* may presently exist on the spawning grounds. Finally, in a light-hearted way, focus group participants did mention that there would be health benefits in eating Striped Bass (i.e. offer *omega 3 acids*).

5. CHALLENGES AND RECOMMENDATIONS CONCERNING DFO QUESTIONNAIRE DESIGN AND IMPLEMENTATION

The questionnaires were an effort to gain quantitative data regarding by-catch numbers and mortality specific to gear type and locations. Such detailed analyses of catches by gear type and location have not been done here. The amount of data is quite rich and worthy of such detailed analyses which may offer managers specific direction for addressing conservation issues facing Striped Bass. Such analyses are being done within DFO and should proceed with some cautionary remarks.

A pre-test of a questionnaire's questionnaire design must be conducted to a sample that is representative of the potential respondents in order to fully take advantage of the lessons learned from pre-testing questionnaires. Ideally the questionnaires should have been pre-tested with individuals from the aboriginal community, fishers and C&P fisheries officers so to improve the form and content of the questionnaires. Questionnaires were only pre-tested with a small group of DFO employees.

The snowball technique research methodology ensured that certain criteria are met, including the need to cover a wide geographic range and a diverse source of respondents and interest groups. However, non-random sampling does not allow for complete generalizations of the population. Also, the questionnaires' sample was small from a social science research perspective. In total, 22 questionnaires were completed by DFO C&P fisheries officers, 11 by fish harvesters and 10 by aboriginal fishery coordinators, guardians, aboriginal fish harvesters and elders. Results from all questionnaires, with the exception of one incomplete from C&P, were analyzed.

Recommendations concerning questionnaire design, implementation and potential further data analyses are provided.

- 1. Increased number of participants.** The total number of respondents to the questionnaires was low and mainly consisted of fisheries officers. Additional efforts in recruiting data from actual fishers would further strengthen the ability to understand all the issues and possibly generalize the results with greater confidence and representativeness. Also, with an increase in the sample size of fishers and fishery officers, a comparison of responses could be made which may help to better understand and validate the results.
- 2. Enhanced communication.** Focus group participants mentioned that instructions during the delivery of the questionnaires were unclear and that there was no follow-up or verification of their information after submitting the questionnaires. In addition, better communication about the questionnaires results and how the data will be used was recommended

by some focus group participants who feared that their responses might be used against them.

3. **Clear definition of terms.** A clear definition of what constituted "small fish" in the questionnaire was needed. As mentioned previously, the low numbers of small Striped Bass reported in the Rainbow Smelt fishery in contrast to previous studies (Bradford et al. 1997) might indicate that young of the year bass were identified as part of the "small bass" category within the questionnaire. Definitions of recreational fishery and illegal fishery were also not clear to some participants.
4. **Use of open-ended questions.** Asking respondents to estimate numbers of fish caught within categories such as <100, 101-1,000, 1,001-5,000, 5,001-10,000 and >10,000 produces ordinal data. As a result, the categories basically can be ordered or ranked from 1 to 5 where it is possible to know that a 5 is more than a 4 which is more than a 3 but the exact differences are not known. During the focus group, respondents tended to respond with the upper limits of several of these categories when asked to give actual numbers. Thus, if researchers use the midpoints of such categories, they may be underestimating the numbers of fish caught. In future questionnaires, open-ended questions would allow participants to offer specific numbers that could then be used in this manner. For example, respondents were asked, using an open-ended format, to estimate the percentage of fish released alive or dead. As an open ended item, ratio level and potentially more accurate measurements were gathered.

6. CLARIFICATION OF ISSUES AND RESPONSE SET OF THE DFO QUESTIONNAIRES

The two questionnaires developed by DFO were based on known fisheries that have observations of Striped Bass by-catch. The COSEWIC assessment report identified by-catch in various fisheries and illegal fisheries as threats to the species recovery (COSEWIC 2004). The RPA mentioned additional sources of human-induced mortality from other fisheries including American Eel, American Herring coastal fisheries and aboriginal fisheries (Fisheries and Oceans 2006). The American Shad and Atlantic Silverside fisheries were also included in the questionnaires as observations indicated that Striped Bass by-catch occurred in these fisheries. DFO presented the results of the analysis of the questionnaires in the Allowable Harm Assessment science meeting (DFO 2011).

Respondents were asked to estimate the size of Striped Bass caught in three categories: small (<12 inches), medium (12 inches to 24 inches) and large (>24 inches). No definition was given to participants regarding these size categories which may have led to some interpretation problems. It is possible that respondents did not consider young-of-the-year bass within the small fish category. For example, there were low numbers of small bass reported captured in the smelt fisheries in contrast to previous years where scientific research (Bradford et al. 1997) has reported high by-catch of young-of-the-year bass.

Individuals were then asked to estimate the total number of Striped Bass caught by year across each of these size categories. The estimate of total Striped Bass caught was measured using an ordinal scale with the following six categories: a) 0 b) <100 c) 101-1,000 d) 1,001-5,000 e) 5,001-10,000 and f) >10,000. While these ordinal categories are mutually exclusive, they are not equal and were not created based on prior knowledge of numbers. Some insight was gained on actual numbers caught when participants of the facilitated focus group workshop offered actual numbers rather than just the categories. For example, respondents stated that 10,000 medium fish were caught when they circled the category 5,001-10,000. In this case, using the midpoint would underestimate the total amount of fish caught.

Within the category 101-1,000, Aboriginal participants stated 878 Striped Bass were caught. Other examples of actual numbers offer additional insight; with regards to small Striped Bass numbers, one participant suggested 200 and 870 within the 101-1,000 category. Another individual offered amounts of 1,000, 350, 200, and 1,000 as examples of medium fish caught. In the category of 1,001-5,000, workshop participants suggested amounts of 3,000 and 5,000 medium fish. In general, it seemed that respondents tended to use the upper limits of the categories which have implications if midpoints were to be used in the DFO analysis. This insight, however, is based on only a few focus group workshop participants. Further workshops would help to better understand the actual numbers of fish caught.

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APPENDIX A: EXAMPLE OF ABORIGINAL SURVEY

ABORIGINAL FISHERIES SURVEY

Assessment of Striped Bass By-catch

In Atlantic Salmon Food, Social and Ceremonial (FSC) gillnet and trap net fisheries

The Department of Fisheries and Oceans (DFO) is carrying out a survey on Striped Bass. The objective of the survey is to gather information on the current description of aboriginal FSC fishery particularly those targeting Atlantic Salmon, and the current extent of Striped Bass by-catch by these fishing activities.

The survey will be carried out by the Eastern New Brunswick Area Aboriginal Program Coordinator, Majella Comeau either with a face to face meeting and/or by telephone. The survey is intended for fisheries coordinators, fishery guardians or Aboriginal fishers in each community. Also, a local C&P fishery officer will also be asked to complete the survey.

The information gathered will help DFO Science to assess whether fishers may receive exemptions, should the species be listed under SARA, which would allow them to pursue certain fisheries while incidentally catching Striped Bass provided that these incidental catches will not jeopardize overall recovery of the population (a regulatory concept under the SARA known as allowable harm). The survey could also allow Science to assess the number of Striped Bass that could potentially be retained in a FSC fishery without compromising the recovery and conservation of the species.

The most recent population estimates for Striped Bass from the southern Gulf will be reviewed at the Striped Bass pre-COSEWIC science meeting (Feb. 2-3, 2011) and these values will be used in the subsequent science review (allowable harm) on February 4, 2011.

Please fill out the survey and return by no later than December 20th, 2010. Please send the completed survey by e-mail to Josiane.Massiera@dfo-mpo.gc.ca and Carole.L.LeBlanc@dfo-mpo.gc.ca.

Please answer the following questions to the best of your ability, given your experience with each of these fisheries. If questions do not apply, please indicate so and move on to the next question. If there is not enough space to answer when filling out the tables, insert new rows and continue from where you left off. Please replace the square (?) in the questionnaire by an X if it applies.

If you have questions or concerns, please feel free to contact Josiane Massiera at (506) 851-7290 or Carole LeBlanc at (506) 395-7722.

Interviewer Name : Title:	Participant Name : Title :
Date:	Method: (telephone, face to face)

Data collection Survey for by-catch of Striped Bass in Atlantic Salmon FSC fisheries using gillnets and trap nets

As per XX First Nation 2010 FSC agreement

Location	Season	Number of gillnets	Number of trap nets		
X River	April 15-June30; (Black Salmon)	3			
X River	July 1- Oct 29	13	1 (assessment trap net)		
X Bay	May 1 - July 31; August 1 - October 15	25			
1) Are Striped Bass caught as by-catch in gillnets or trap nets in your area?		X River – gillnets <input type="checkbox"/> YES <input type="checkbox"/> NO			
2) What time of the year is Striped Bass caught in Atlantic Salmon FSC gillnet and trapnet fisheries?		X River – trapnets <input type="checkbox"/> YES <input type="checkbox"/> NO			
		X Bay - gillnets <input type="checkbox"/> YES <input type="checkbox"/> NO			
		<input type="checkbox"/> Jan. <input type="checkbox"/> Feb.	<input type="checkbox"/> March <input type="checkbox"/> April		
		<input type="checkbox"/> May <input type="checkbox"/> June	<input type="checkbox"/> July <input type="checkbox"/> August		
		<input type="checkbox"/> Sept. <input type="checkbox"/> Oct.	<input type="checkbox"/> Nov. <input type="checkbox"/> Dec.		
3) For the next section, we would like to know your opinion on how many bass are caught on average each year by size. Please choose a gear type, the number of gear, the estimated size of Striped Bass caught, the estimated total by year as well as their condition of release. Please choose from the provided choices.					
Area fished	Gear type and number of active gear	Estimated Size of Striped Bass caught	Estimate of total Striped Bass caught by year	Estimated % Released alive	Estimated % Release dead
X River	# active gear _____ <input type="checkbox"/> Gill net <input type="checkbox"/> Trap net	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
X River	# active gear _____ <input type="checkbox"/> Gill net <input type="checkbox"/> Trap net	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000	_____%	_____%

		to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____		
X River	# active gear _____ <input type="checkbox"/> Gill net <input type="checkbox"/> Trap net	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
X Bay	# active gear _____ <input type="checkbox"/> Gill net <input type="checkbox"/> Trap net	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
X Bay	# active gear _____ <input type="checkbox"/> Gill net <input type="checkbox"/> Trap net	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
4) On average, how many gillnets or trapnets are used per day during the season?		Comments:			
5) Can you suggest any measures to reduce or eliminate by-catch in FSC fisheries, or improve survival of Striped Bass that are released?		Comments:			

Any other pertinent information:

APPENDIX B: EXAMPLE OF THE CONSERVATION AND PROTECTION SURVEY

Assessment of Striped Bass By-catch Conservation and Protection Survey

The Species at Risk (SAR) group is currently gathering information on Striped Bass (*Morone saxatilis*) by-catch in various commercial, recreational and illegal fisheries. This information will be used to assist Science in providing advice on allowable harm, meaning the amount of human-induced mortality or harm that would not jeopardize the survival or recovery of the species. The allowable harm science review will take place on February 4, 2011, immediately following the Striped Bass pre-COSEWIC science meeting (Feb. 2-3, 2011). The most recent population estimates for Striped Bass from the southern Gulf will be reviewed at that meeting and these values will be used in the subsequent allowable harm assessment.

The 2006 Recovery Potential Assessment (RPA) for the southern Gulf of St. Lawrence Striped concluded that the illegal fishery of Striped Bass and incidental mortality from by-catch in various fisheries constituted the most important constraints to recovery of the species. As a result, supplementary information on these fisheries is required in order to assess the current extent of by-catch of Striped Bass by fishing activities and to assess if they jeopardize or not the survival or recovery of the species. We would also like to receive your opinion on possible options for reducing or eliminating the by-catch or improving the survival of Striped Bass released.

The survey is intended to be filled out by each C&P Detachment supervisor in the Gulf Region. Each detachment supervisor will be asked to answer this survey to the best of their knowledge and provide estimates. We also ask that each supervisor refer another Fishery Officer in each detachment, as well as a Fishery Officer for each sub-detachment who would be the best to respond to this questionnaire on Striped Bass.

The SAR group would also like to have the input of fish harvesters who participate in the commercial gaspareau, herring, silverside, eel and smelt fisheries, as well as the recreational fishery. If you could refer one respected fish harvester in your area who would be a good candidate to respond to this survey, it would be much appreciated.

Please answer the following questions to the best of your ability, given your experience with each of these fisheries. If any fisheries do not occur in your region, please indicate so and move on to the next question. When filling out the tables, if there is not enough space to answer all questions, insert new rows and continue from where you left off. Please replace the square (□) in the questionnaire by an X if it applies. An example of a completed table is available in Appendix A

Please fill out questionnaire and return by no later than **December 20th, 2010**. Please send the completed survey by e-mail to Sylvie.Leger@dfo-mpo.gc.ca or by mail: Attention Sylvie Léger, Senior Compliance Program Officer, Conservation & Protection, Fisheries and Oceans Canada, 343 Ave. Université Avenue, Moncton NB E1C 9B6. If you have questions or concerns, please feel free to contact Sylvie Leger at (506) 851-7729 or fax (506) 851-2504.

Survey completed by: Name and title		Detachment or sub- detachment	
Date:			

Data Collection Survey for By-catch of Striped Bass in Recreational Fisheries

Recreational Fisheries (ex. Salmon, trout, mackerel, smelt, etc.)						
1) Where do the recreational fisheries occur within your detachment boundaries?		Please circle on the map provided for your detachment and number each area. (See attached map(s))				
2) During what time of the year are Striped Bass caught in the recreational fisheries? (more than one month can be checked)		<input type="checkbox"/> Jan. <input type="checkbox"/> Feb.	<input type="checkbox"/> March <input type="checkbox"/> April	<input type="checkbox"/> May <input type="checkbox"/> June	<input type="checkbox"/> July <input type="checkbox"/> August	<input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.
3) For the next section, we would like to know your opinion on how many bass are caught on average each year by size. Per areas identified on the map in your detachment, please choose a gear type, the estimated size of Striped Bass caught, the estimated total by year as well as their condition of release. Please choose from the provided choices.						
Area identified in map	Gear type and number of gear	Estimated Size of Striped Bass caught	Estimate of total Striped Bass caught by year	Estimated % Released alive	Estimated % Release dead or retained	
	# gear _____ <input type="checkbox"/> Angling <input type="checkbox"/> Spear <input type="checkbox"/> Dip net <input type="checkbox"/> Artificial Fly <input type="checkbox"/> Other	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%	
	# gear _____ <input type="checkbox"/> Angling <input type="checkbox"/> Spear <input type="checkbox"/> Dip net <input type="checkbox"/> Artificial Fly <input type="checkbox"/> Other	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%	
	# gear _____ <input type="checkbox"/> Angling <input type="checkbox"/> Spear <input type="checkbox"/> Dip net <input type="checkbox"/> Artificial Fly <input type="checkbox"/> Other	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%	

	# gear _____ <input type="checkbox"/> Angling <input type="checkbox"/> Spear <input type="checkbox"/> Dip net <input type="checkbox"/> Artificial Fly <input type="checkbox"/> Other	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
	# gear _____ <input type="checkbox"/> Angling <input type="checkbox"/> Spear <input type="checkbox"/> Dip net <input type="checkbox"/> Artificial Fly <input type="checkbox"/> Other	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
4) Can you suggest any measures to reduce or eliminate by-catch in the recreational fisheries, or improve survival of Striped Bass that are released? (ex. area closures, restrictions, changes in seasons or gear, ect.)		Comments:			
5) Recommended mitigation measures from the RPA: Would the closure of angling in staging and spawning ground on the Northwest Miramichi River in May and June reduce the harm to Striped Bass for this activity?		Comments:			

Any other pertinent information:

Data Collection Survey for By-catch of Striped Bass in Gaspereau Fisheries

Gaspereau Fisheries					
1) Where do the Gaspereau fisheries occur within your detachment boundaries?		Please circle on the map provided for your detachment and number each area. (See attached map(s))			
2) During what time of the year are Striped Bass caught in the gaspereau fisheries? (more than one month can be checked)		<input type="checkbox"/> May <input type="checkbox"/> July <input type="checkbox"/> June <input type="checkbox"/> August			
3) For the next section, we would like to know your opinion on how many bass are caught on average each year by size. Per areas identified on the map in your detachment, please choose a gear type, the estimated size of Striped Bass caught, the estimated total by year as well as their condition of release. Please choose from the provided choices.					
Area identified in map	Gear type and number of gear	Estimated Size of Striped Bass caught	Estimate of total Striped Bass caught by year	Estimated % Released alive	Estimated % Release dead or retained
	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Trap nets <input type="checkbox"/> Square nets <input type="checkbox"/> Weirs <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Trap nets <input type="checkbox"/> Square nets <input type="checkbox"/> Weirs <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Trap nets <input type="checkbox"/> Square nets <input type="checkbox"/> Weirs <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%

	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Trap nets <input type="checkbox"/> Square nets <input type="checkbox"/> Weirs <input type="checkbox"/> Other	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____ %	_____ %
	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Trap nets <input type="checkbox"/> Square nets <input type="checkbox"/> Weirs <input type="checkbox"/> Other	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____ %	_____ %
Does efficient culling of Striped Bass caught in trap nets improve their chance of survival?		Comments: Yes/No. Explain			
Can you suggest any measures to reduce or eliminate by-catch in the gaspereau fishery or improve survival of Striped Bass that are released? (ex. area closures, restrictions, changes in seasons or gear, ect.)		Comments:			

Any other pertinent information:

Data Collection Survey for By-catch of Striped Bass in Smelt Fisheries

Smelt Fisheries					
1) Where do the smelt fisheries occur within your detachment boundaries?		Please circle on the map provided for your detachment and number each area. (See attached map(s))			
2) During what time of the year are Striped Bass caught in the smelt fisheries? (more than one month can be checked)		<input type="checkbox"/> Jan. <input type="checkbox"/> March <input type="checkbox"/> Sept. <input type="checkbox"/> Nov. <input type="checkbox"/> Feb. <input type="checkbox"/> April <input type="checkbox"/> Oct. <input type="checkbox"/> Dec.			
3) For the next section, we would like to know your opinion on how many bass are caught on average each year by size. Per areas identified on the map in your detachment, please choose a gear type, the estimated size of Striped Bass caught, the estimated total by year as well as their condition of release. Please choose from the provided choices.					
Area identified in map	Gear type and number of gear	Estimated Size of Striped Bass caught	Estimate of total Striped Bass caught by year	Estimated % Released alive	Estimated % Release dead or retained
	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Bag nets <input type="checkbox"/> Box nets <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____ %	_____ %
	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Bag nets <input type="checkbox"/> Box nets <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____ %	_____ %
	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Bag nets <input type="checkbox"/> Box nets <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____ %	_____ %
	# gear _____ <input type="checkbox"/> Gill nets	<input type="checkbox"/> Small(<12 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100	_____ %	_____ %

	<input type="checkbox"/> Bag nets <input type="checkbox"/> Box nets <input type="checkbox"/> Other _____	<input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____		
	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Bag nets <input type="checkbox"/> Box nets <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____ %	_____ %
4) A delay in the opening of the season (as in the Miramichi system in 1999) by two weeks is thought to have significantly reduced by-catch of Striped Bass. Based upon your experience, would this be true?		Comments: Yes/No. Explain			
5) Can you suggest any measures to reduce or eliminate by-catch in the smelt fishery, or improve survival of Striped Bass that are released? (ex. area closures, restrictions, changes in seasons or gear, ect.)		Comments:			

Any other pertinent information:

Data Collection Survey for By-catch of Striped Bass in American Eel Fisheries

American Eel Fisheries					
1) Where do the American Eel fisheries occur within your detachment boundaries?		Please circle on the map provided for your detachment and number each area. (See attached map(s))			
2) During what time of the year are Striped Bass caught in the American Eel fisheries? (more than one month can be checked)		<input type="checkbox"/> Jan. <input type="checkbox"/> Feb.	<input type="checkbox"/> March <input type="checkbox"/> April	<input type="checkbox"/> May <input type="checkbox"/> June	<input type="checkbox"/> July <input type="checkbox"/> August
<input type="checkbox"/> Sept. <input type="checkbox"/> Oct.					
<input type="checkbox"/> Nov. <input type="checkbox"/> Dec.					
3) For the next section, we would like to know your opinion on how many bass are caught on average each year by size. Per areas identified on the map in your detachment, please choose a gear type, the estimated size of Striped Bass caught, the estimated total by year as well as their condition of release. Please choose from the provided choices.					
Area identified in map	Gear type and number of gear	Estimated Size of Striped Bass caught	Estimate of total Striped Bass caught by year	Estimated % Released alive	Estimated % Release dead or retained
	# gear _____ <input type="checkbox"/> Eel Traps <input type="checkbox"/> Eel pots <input type="checkbox"/> Spears <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
	# gear _____ <input type="checkbox"/> Eel Traps <input type="checkbox"/> Eel pots <input type="checkbox"/> Spears <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
	# gear _____ <input type="checkbox"/> Eel Traps <input type="checkbox"/> Eel pots <input type="checkbox"/> Spears <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
4) Can you suggest any measures to reduce or eliminate by-catch in the American Eel fishery, or improve survival of Striped Bass that are released? (ex. area closures, restrictions, changes in seasons or gear, ect.)			Comments:		

Data Collection Survey for By-catch of Striped Bass in Herring Fisheries

Herring Fisheries					
1) Where do the Herring fisheries occur within your detachment boundaries?		Please circle on the map provided for your detachment and number each area. (See attached map(s))			
During what time of the year are Striped Bass caught in the Herring fisheries? (more than one month can be checked)		<input type="checkbox"/> March <input type="checkbox"/> April	<input type="checkbox"/> May <input type="checkbox"/> June	<input type="checkbox"/> July <input type="checkbox"/> August	<input type="checkbox"/> Sept. <input type="checkbox"/> Oct.
3) For the next section, we would like to know your opinion on how many bass are caught on average each year by size. Per areas identified on the map in your detachment, please choose a gear type, the estimated size of Striped Bass caught, the estimated total by year as well as their condition of release. Please choose from the provided choices.					
Area identified in map	Gear type and number of gear	Estimated Size of Striped Bass caught	Estimate of total Striped Bass caught by year	Estimated % Released alive	Estimated % Release dead or retained
	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Purse Seine <input type="checkbox"/> Weir <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Purse Seine <input type="checkbox"/> Weir <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
	# gear _____ <input type="checkbox"/> Gill nets <input type="checkbox"/> Purse Seine <input type="checkbox"/> Weir <input type="checkbox"/> Other _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____	_____%	_____%
4) Can you suggest any measures to reduce or eliminate by-catch in the herring fishery, or improve survival of Striped Bass that are released? (ex. area closures, restrictions, changes in seasons or gear, ect.)			Comments:		

Data Collection Survey for Illegal Fisheries of Striped Bass

Illegal Fisheries						
1) Where do the illegal fisheries occur within your detachment boundaries?		Please circle on the map provided for your detachment and number each area. (See attached map(s))				
2) During what time of the year are Striped Bass caught? (more than one month can be checked)		<input type="checkbox"/> Jan. <input type="checkbox"/> Feb.	<input type="checkbox"/> March <input type="checkbox"/> April	<input type="checkbox"/> May <input type="checkbox"/> June	<input type="checkbox"/> July <input type="checkbox"/> August	<input type="checkbox"/> Sept. <input type="checkbox"/> Oct. <input type="checkbox"/> Nov. <input type="checkbox"/> Dec.
3) For the next section, we would like to know your opinion on how many bass are caught on average each year by size. Per areas identified on the map in your detachment, please choose a gear type, the number of gear, the estimated size of Striped Bass caught, the estimated total by year as well as any comments. Please choose from the provided choices.						
Area identified in map	Gear type and number of gear	Estimated Size of Striped Bass caught	Estimate of total Striped Bass caught by year	Comments:		
	Gear type _____ # gear _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____			
	Gear type _____ # gear _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____			
	Gear type _____ # gear _____	<input type="checkbox"/> Small(<12 inches) <input type="checkbox"/> Medium(12 inches to 24 inches) <input type="checkbox"/> Large (>24 inches)	<input type="checkbox"/> 0 <input type="checkbox"/> < 100 <input type="checkbox"/> 101-1,000 <input type="checkbox"/> 1,001-5,000 <input type="checkbox"/> 5,001-10,000 <input type="checkbox"/> >10,000 other _____			
Can you suggest any measures to reduce or eliminate the illegal fisheries of Striped Bass? (ex. area or season closures to all in tidal or marine recreational fisheries, gear changes, ect.)		Comments:				

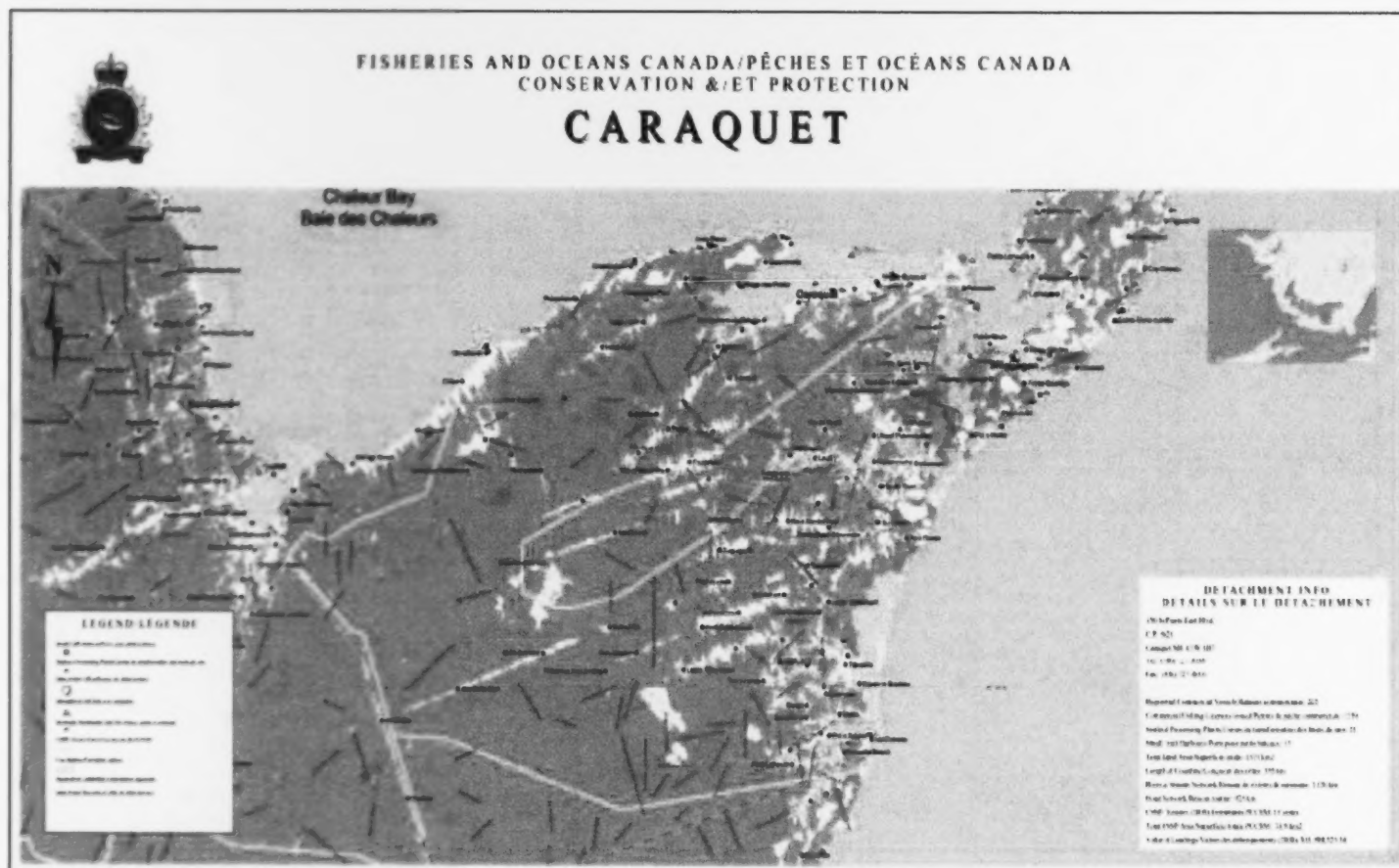


Figure1: Overview of the Caraquet detachment

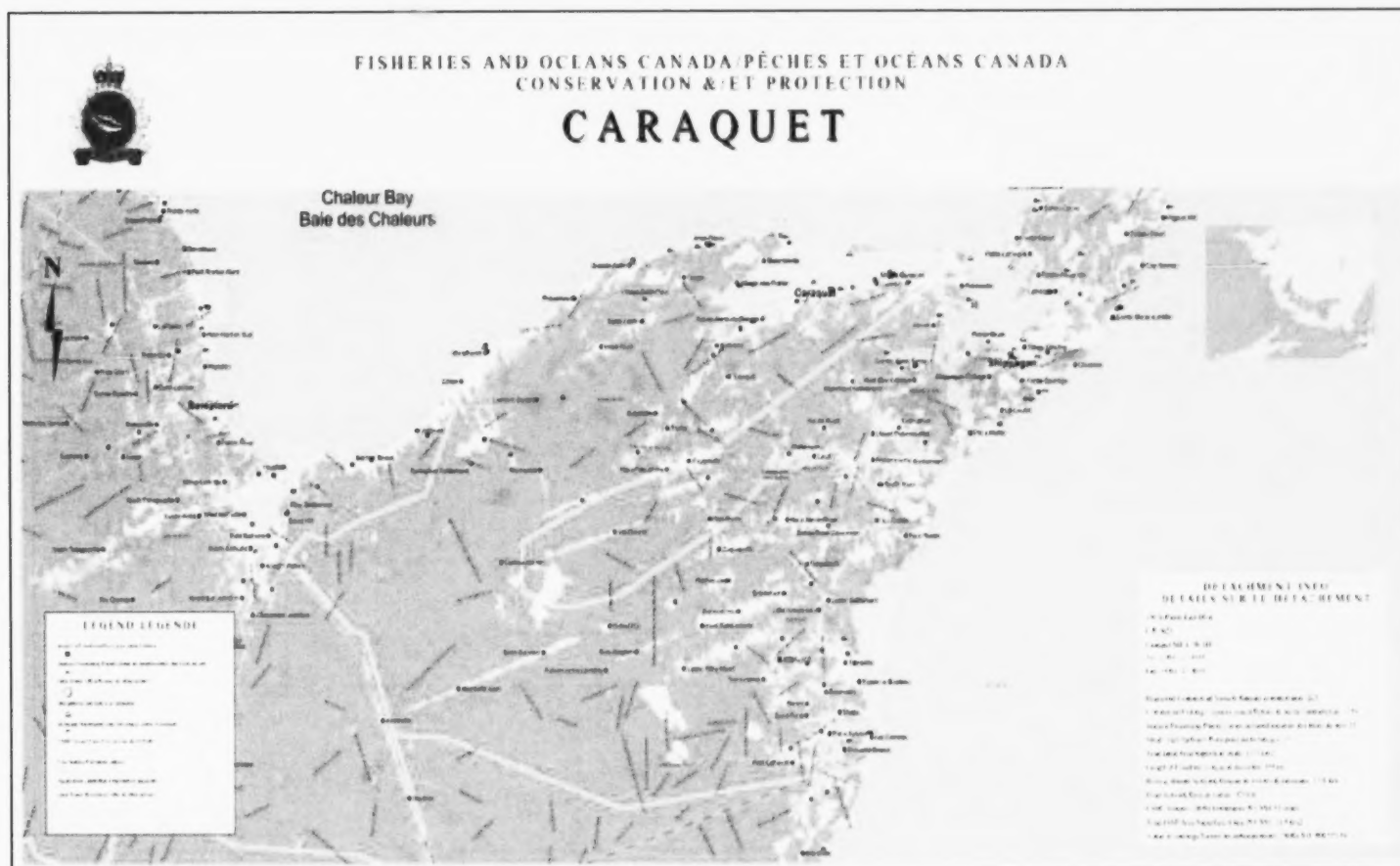


Figure1: Overview of the Caraquet detachment



Figure2: Caraquet detachment

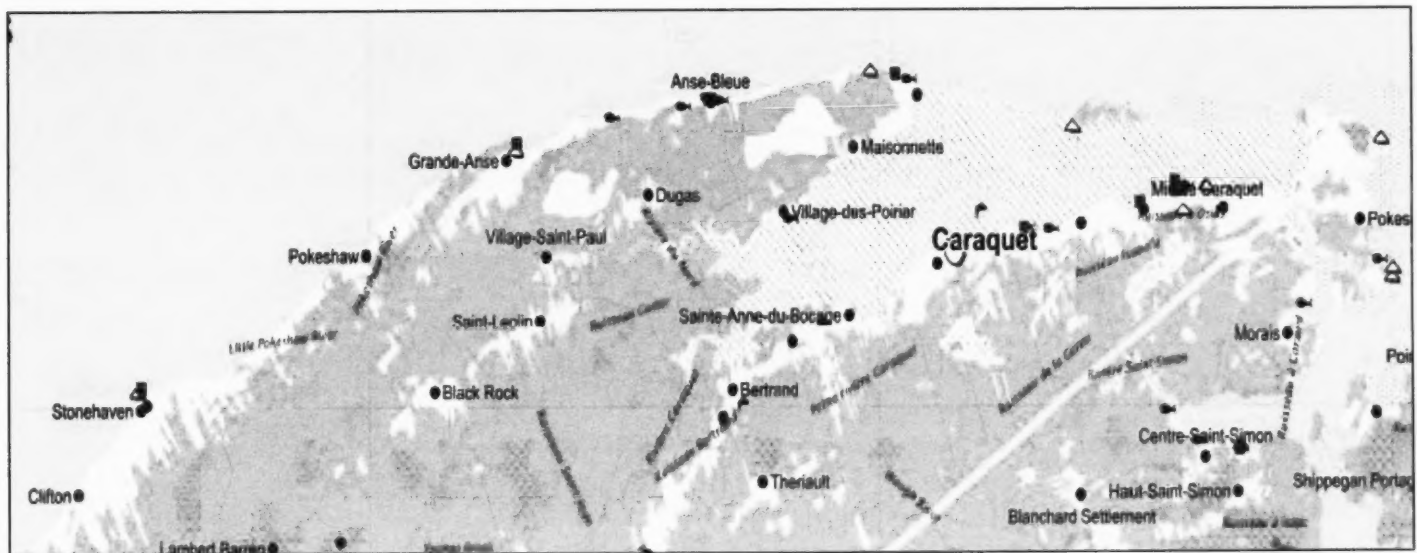


Figure2: Caraquet detachment

APPENDIX C: RESULTS OF THE HUMAN DIMENSION FACILITATED WORKSHOP

**Facilitation Results Regarding Striped Bass
Workshop**

Moncton, New Brunswick

February, 2-5th, 2011

Bath and Associates, 48 Old Pine Line, Middle Cove, NL, A1K 5A1

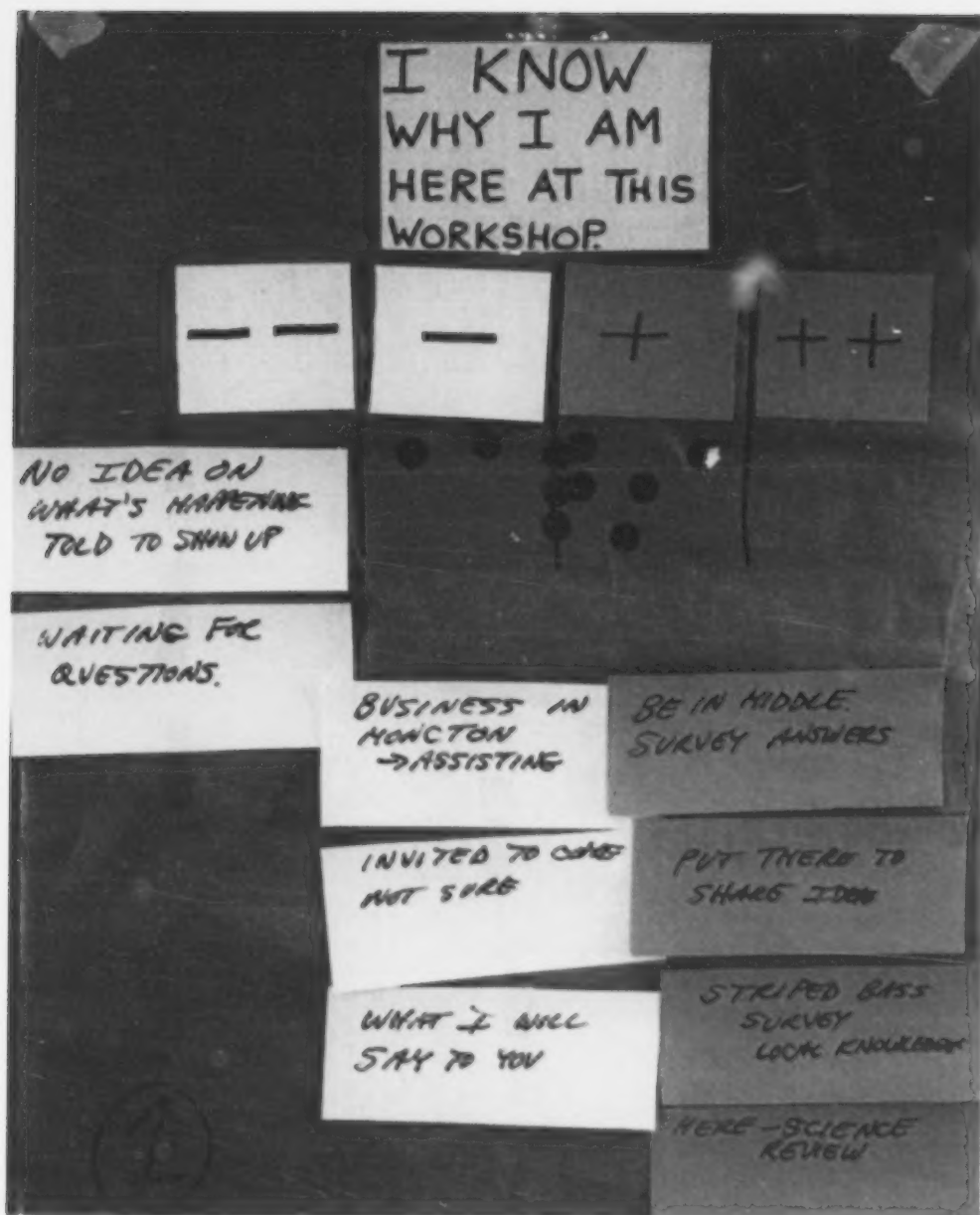


Figure C1: HDFWA participants were asked if they knew why they were at the workshop and if they believed the situation was getting worse or better regarding the Striped Bass.

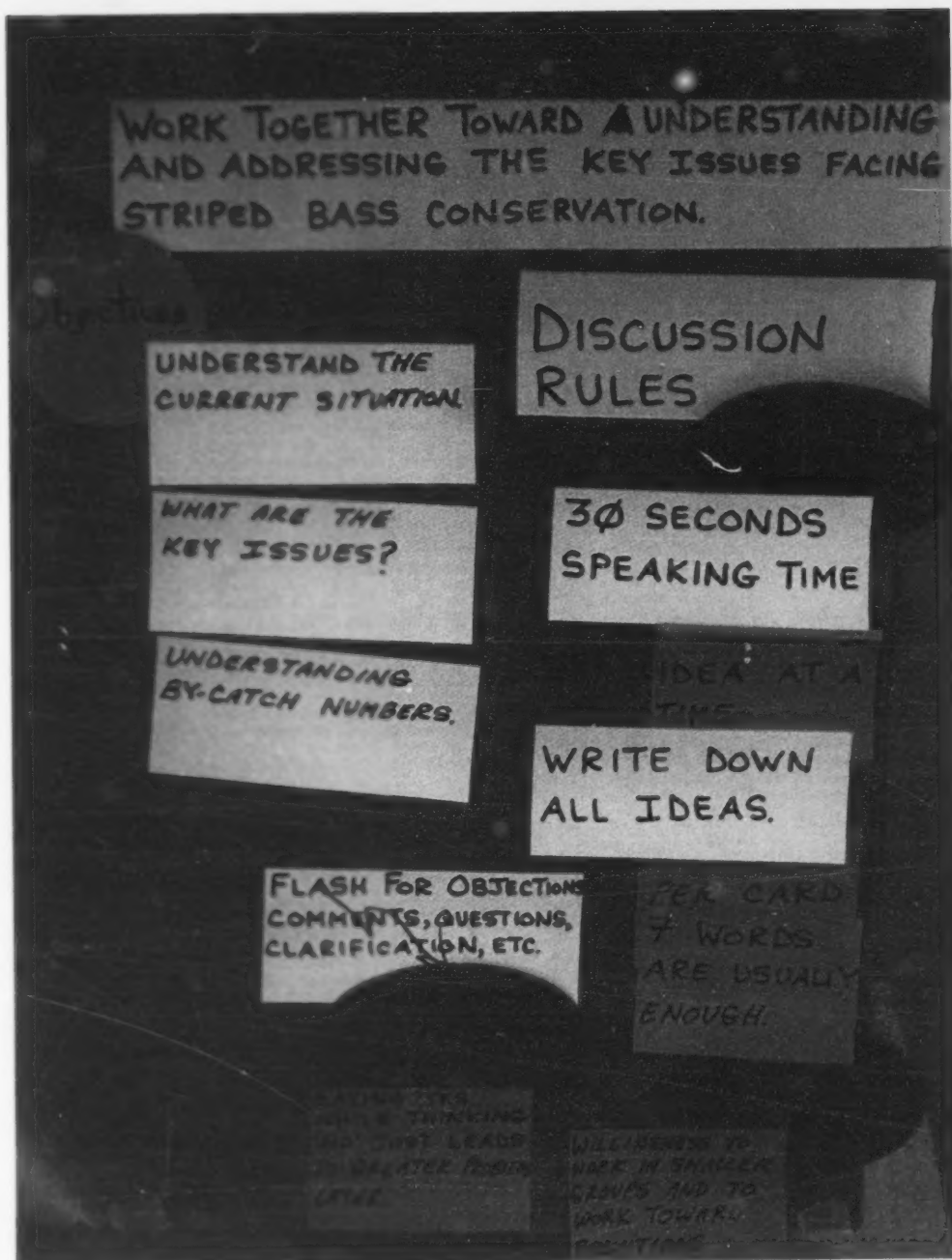


Figure C2: Visual aids informed the participants on the goals, the objectives and the discussion rules for the workshop.

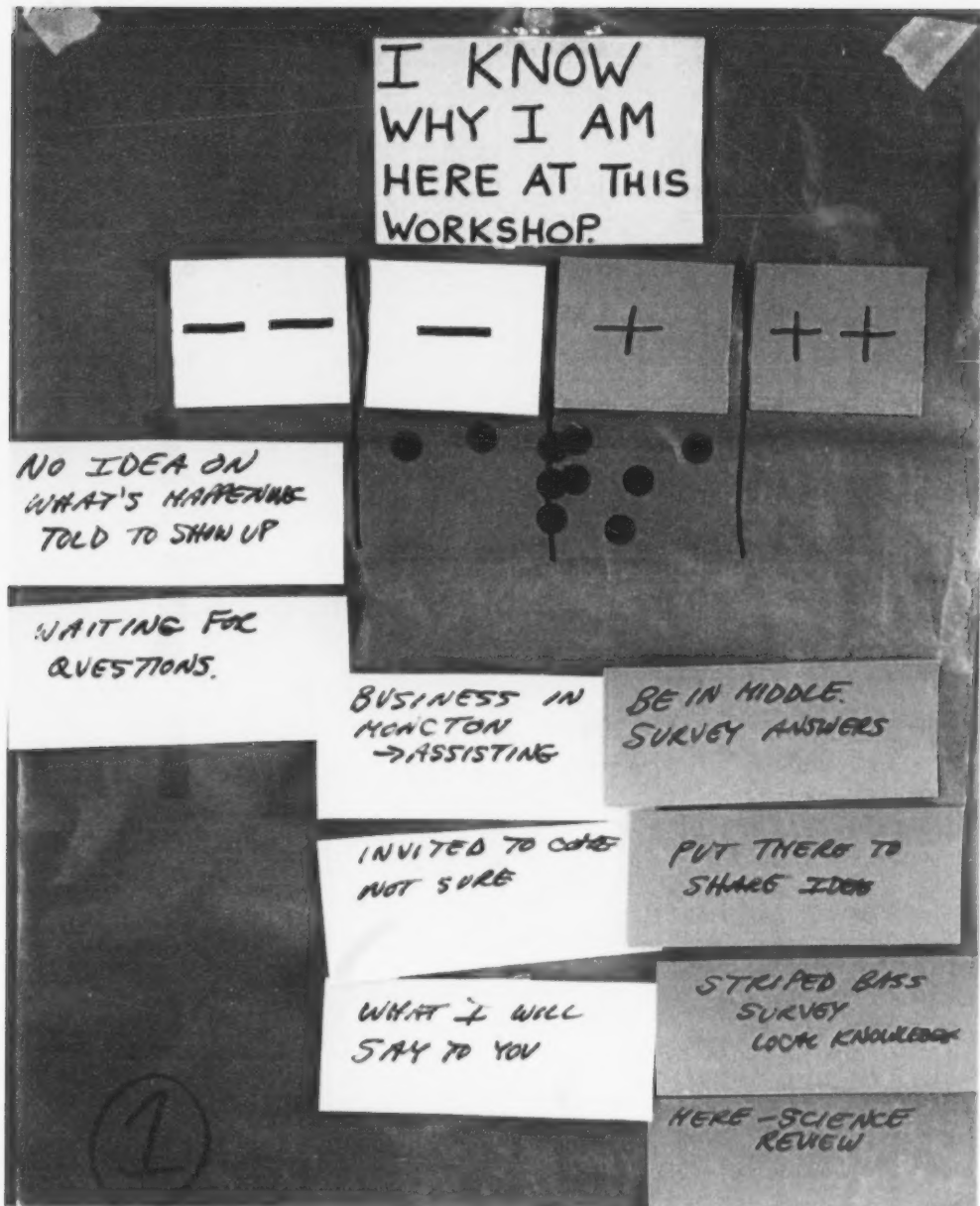


Figure C1: HFDWA participants were asked if they knew why they were at the workshop and if they believed the situation was getting worse or better regarding the Striped Bass.

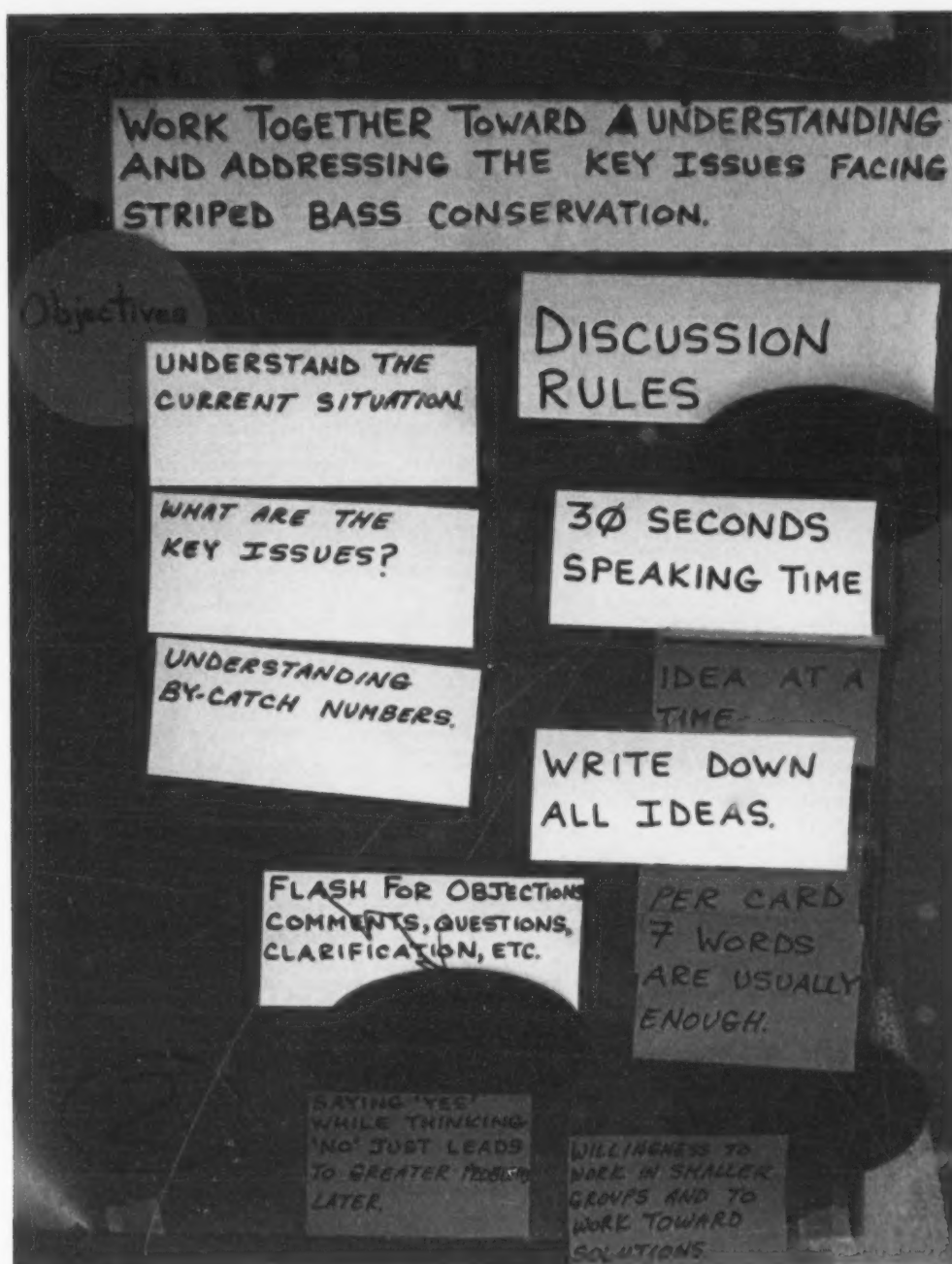


Figure C2: Visual aids informed the participants on the goals, the objectives and the discussion rules for the workshop.

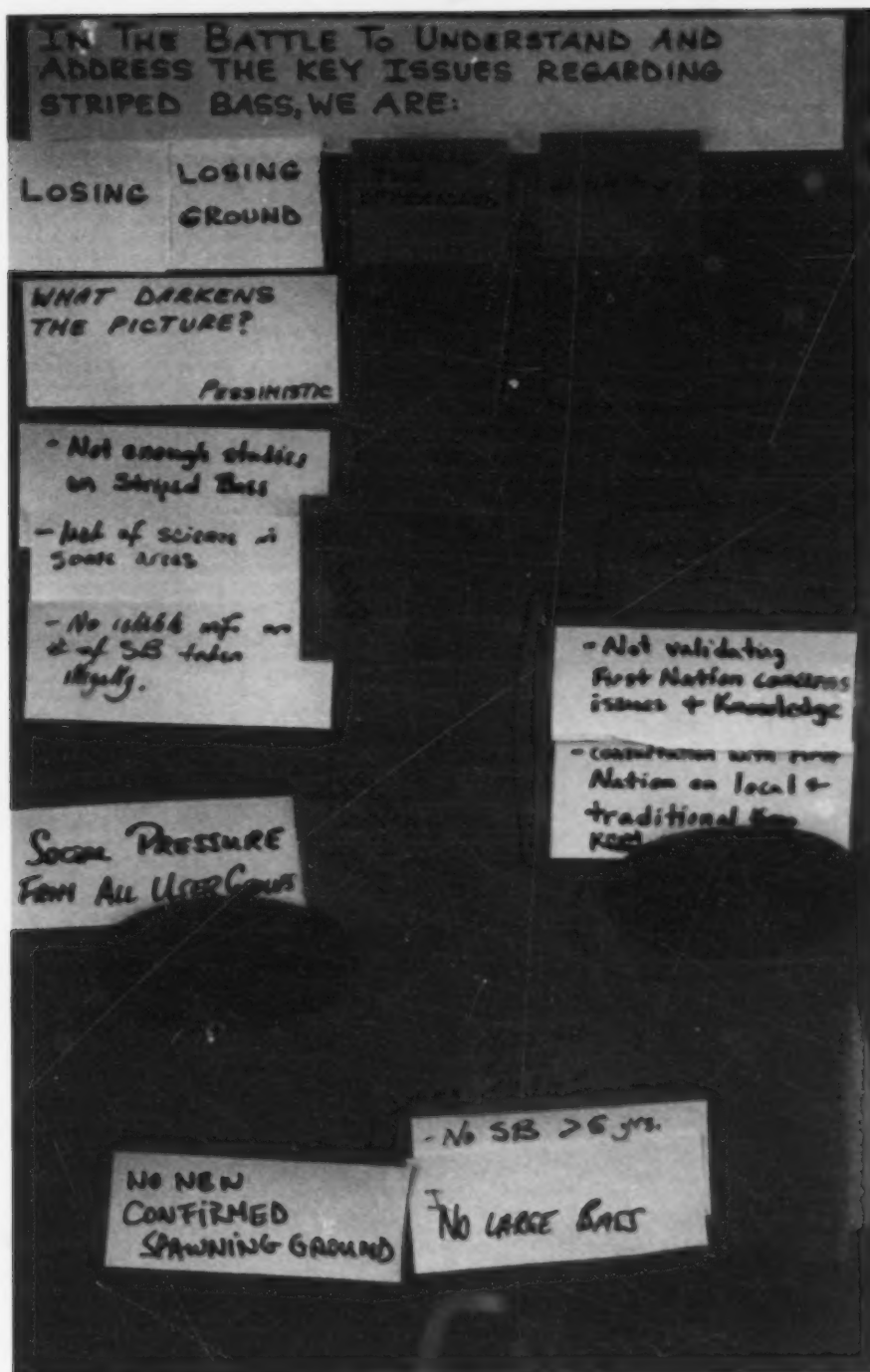


Figure C3: Issues that made participants pessimistic about the current status of Striped Bass.

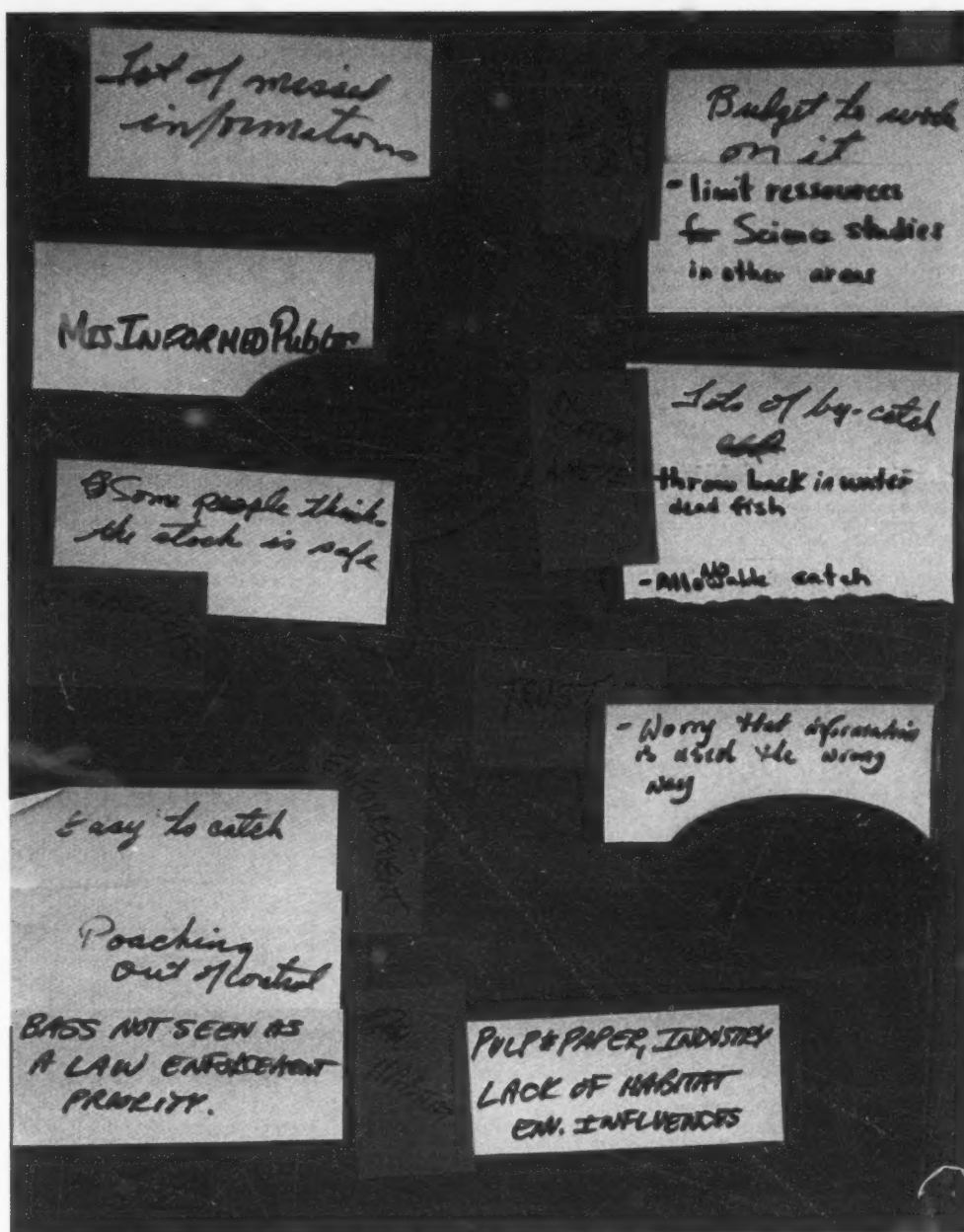


Figure C4: More issues that made participants pessimistic about the current status of Striped Bass.

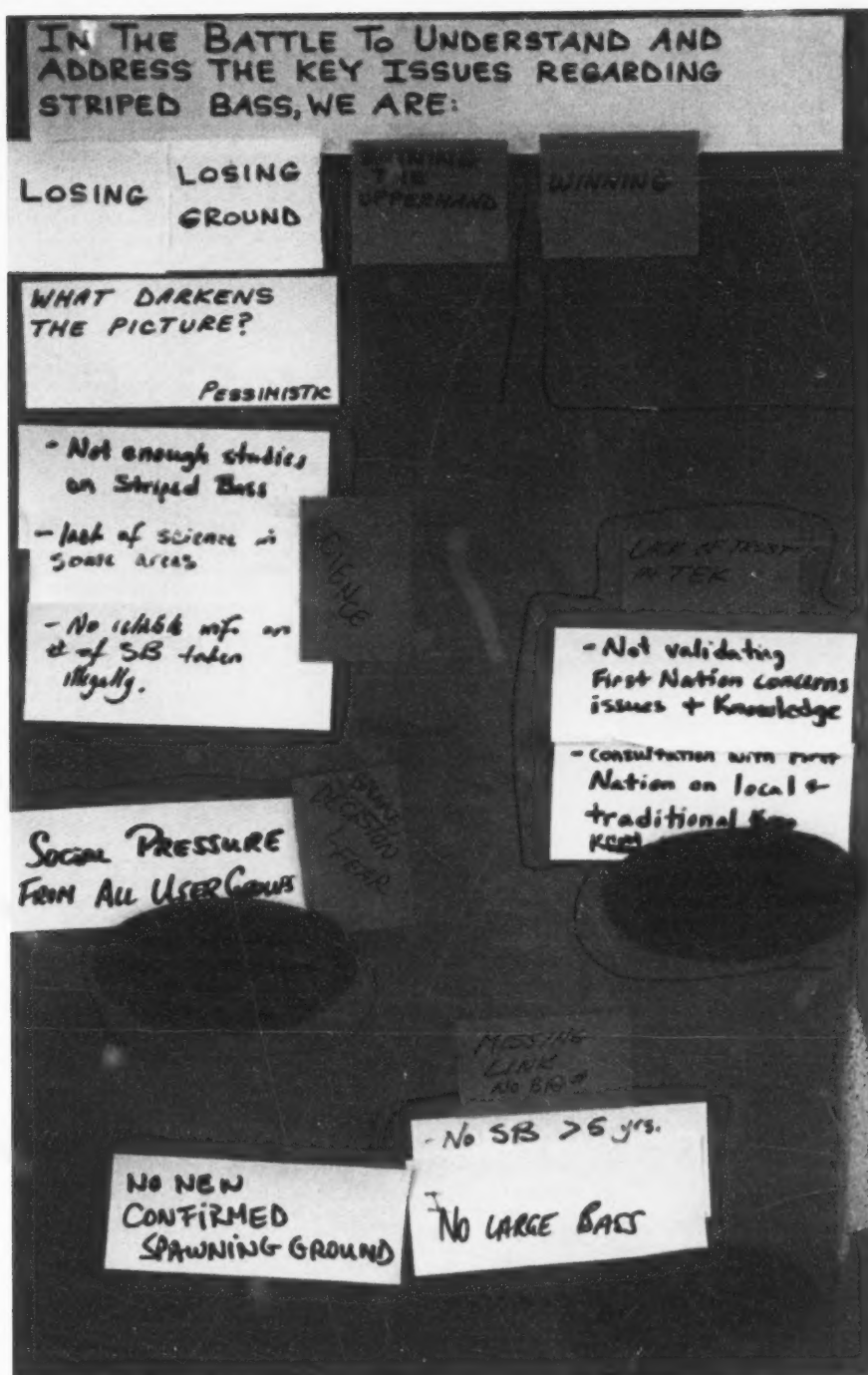


Figure C3: Issues that made participants pessimistic about the current status of Striped Bass.

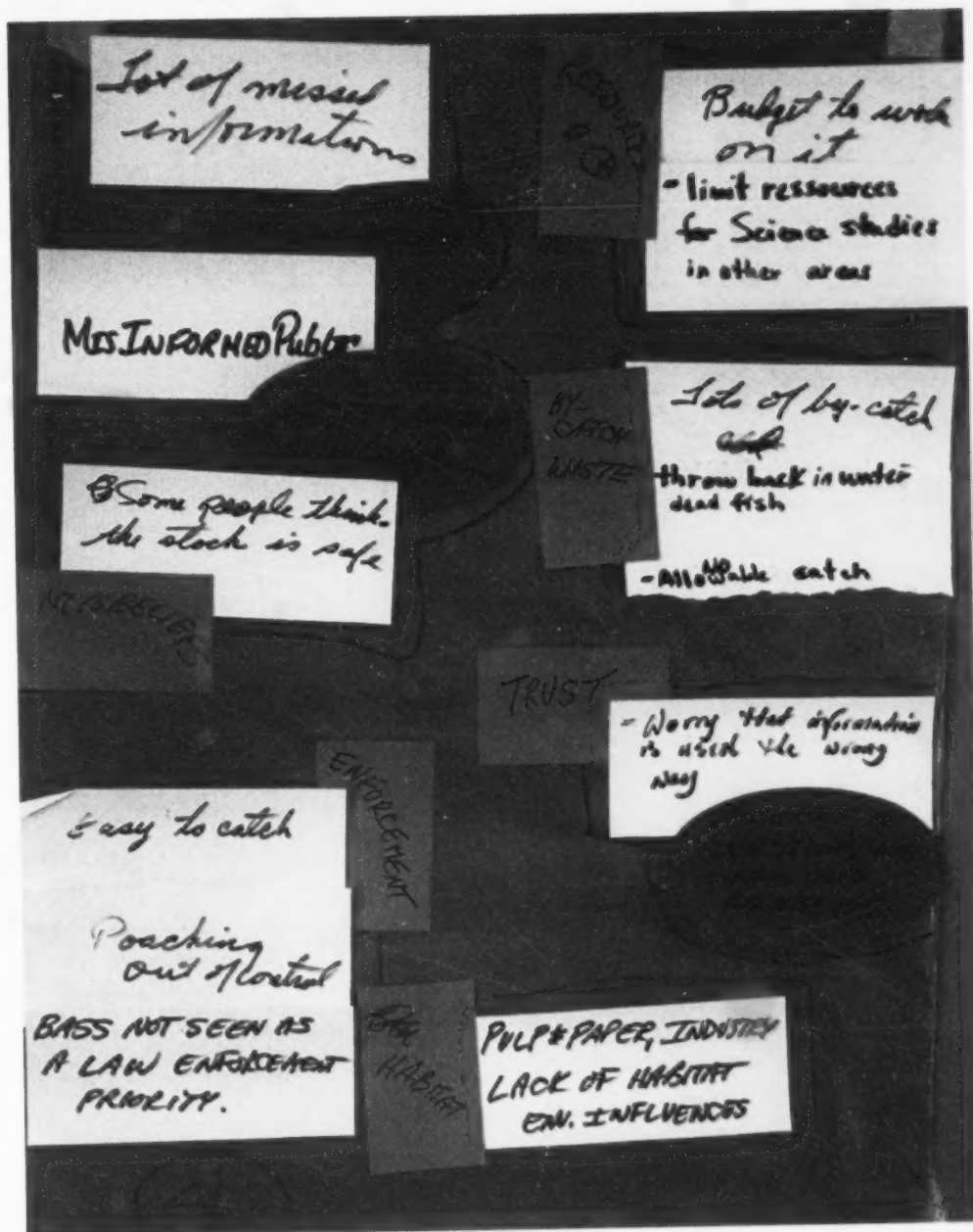
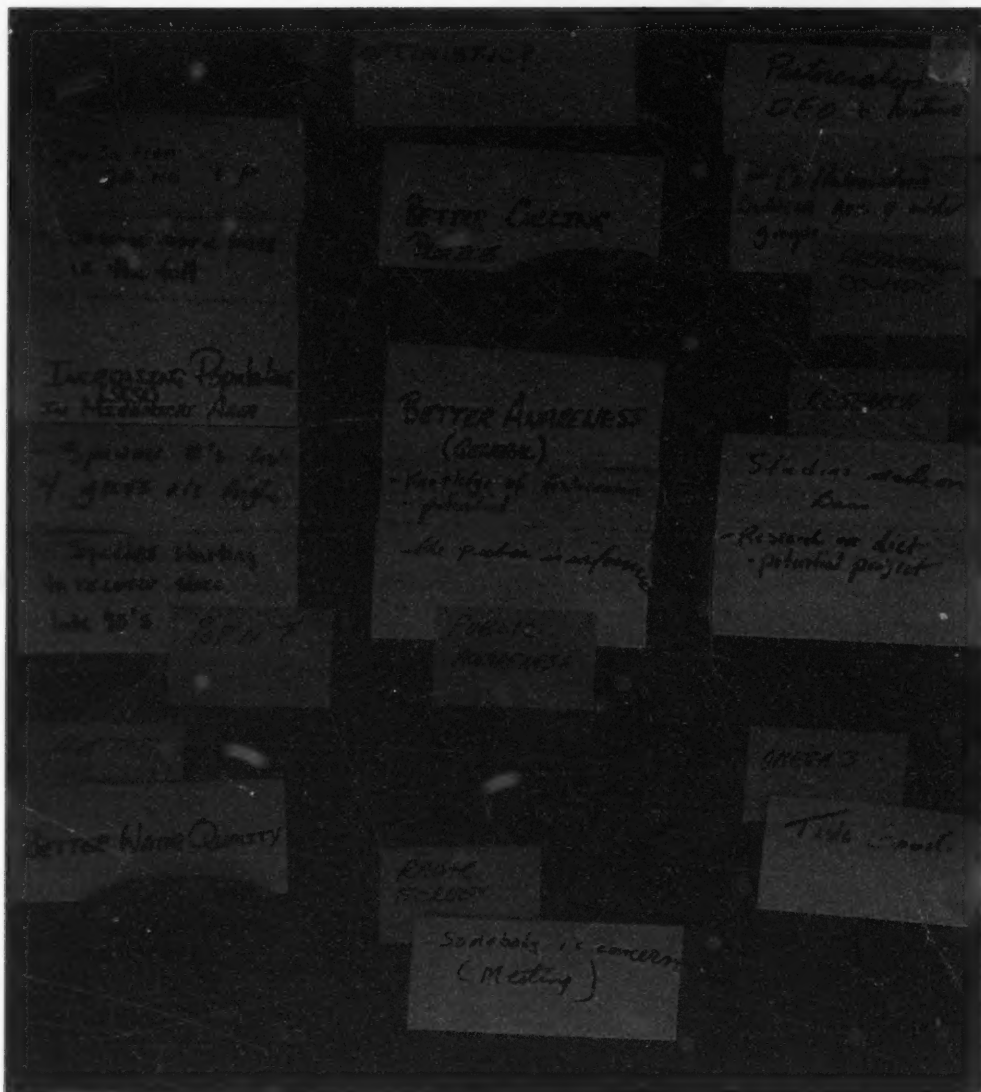


Figure C4: More issues that made participants pessimistic about the current status of Striped Bass.



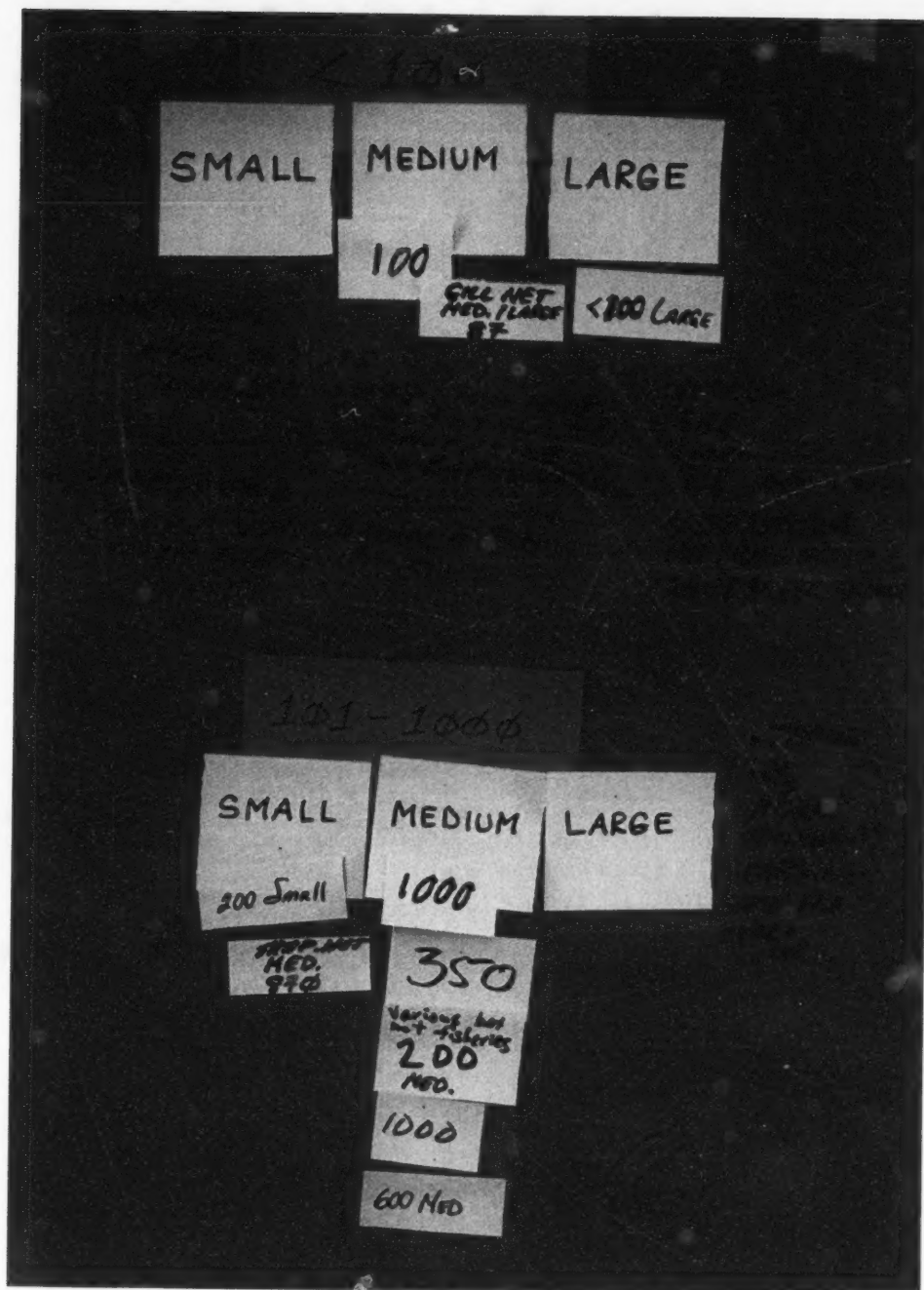


Figure C6: Participants estimated the total number of Striped Bass caught by year across three size categories (small, medium and large) in ordinal categories (< 100 individuals and between 101 and 1,000 ind.).

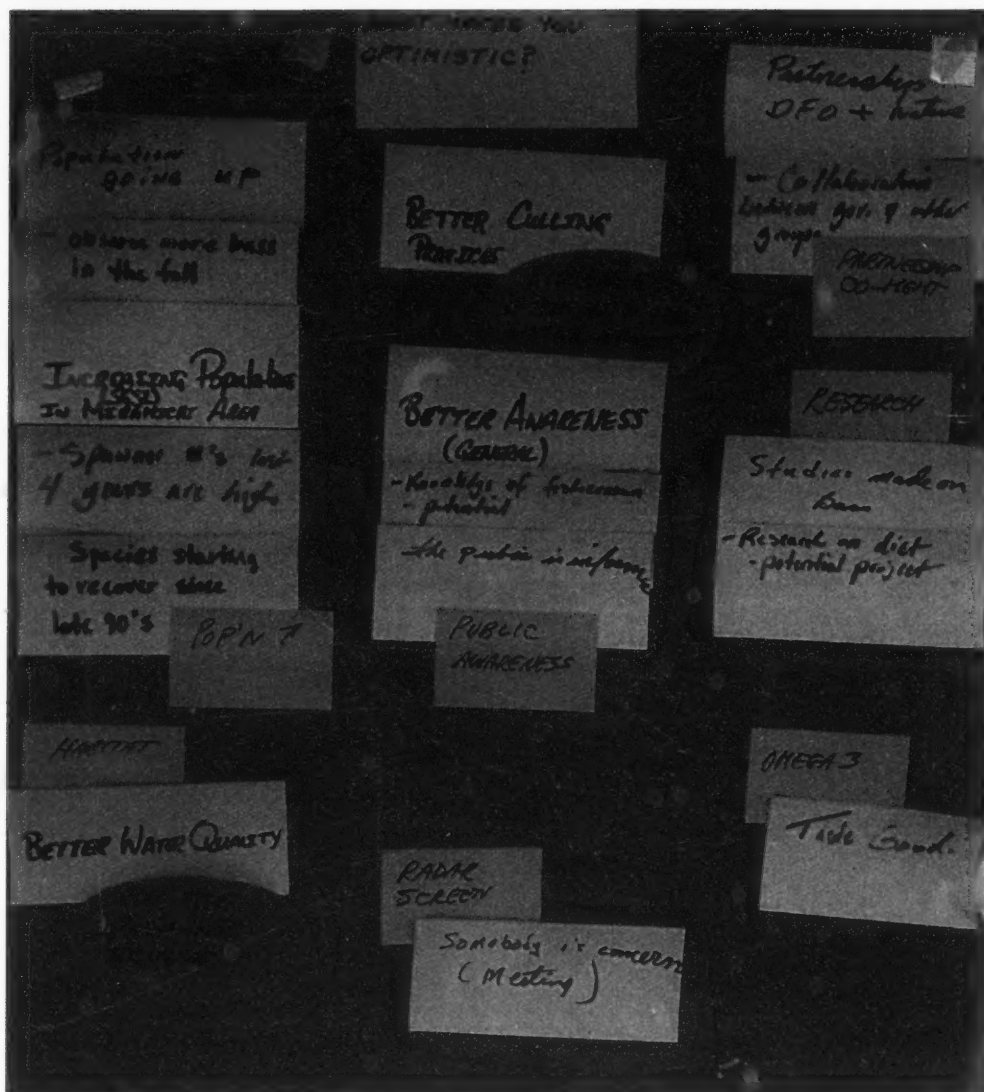


Figure C5: Issues that made participants optimistic about the current status of the Striped Bass.

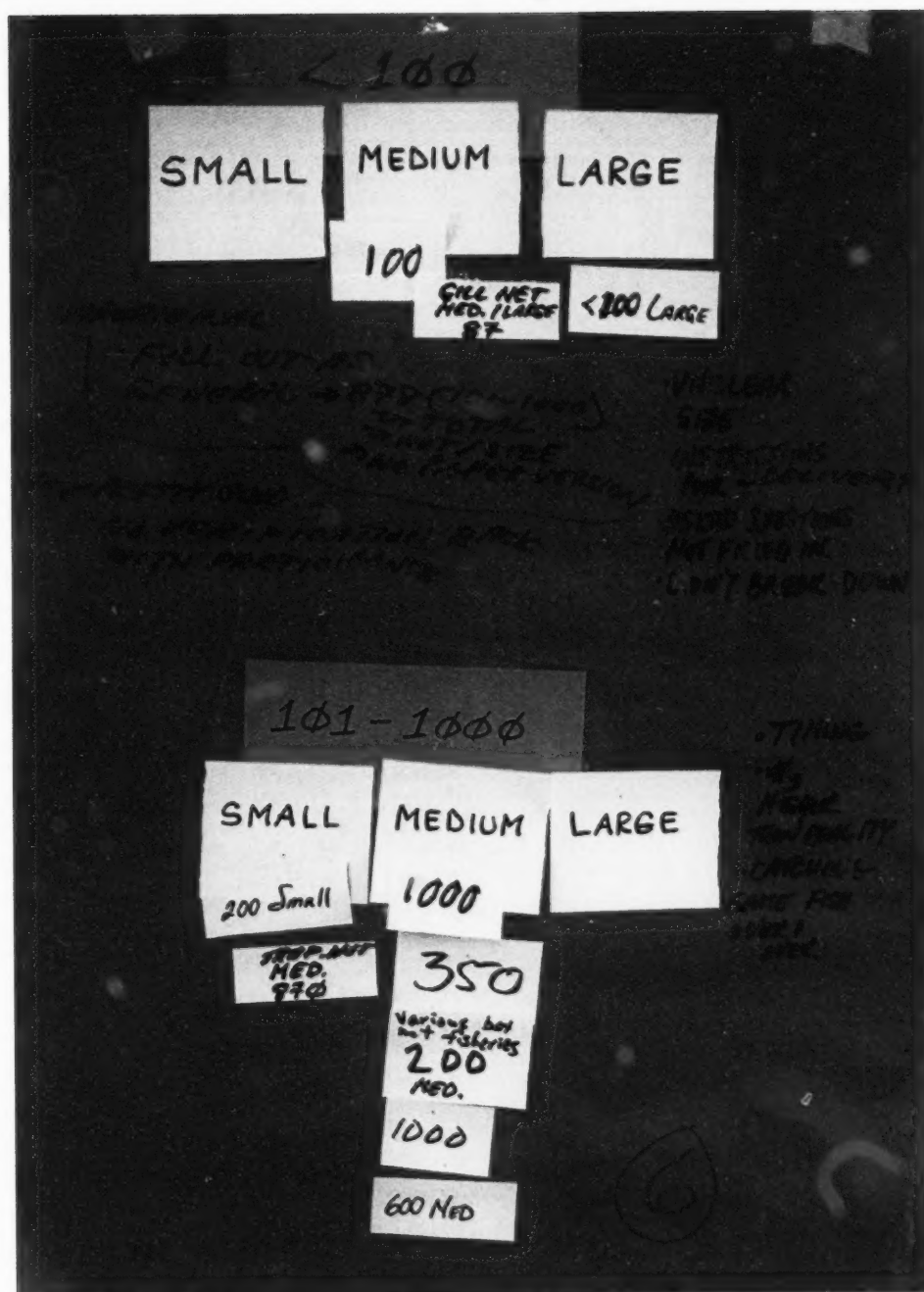


Figure C6: Participants estimated the total number of Striped Bass caught by year across three size categories (small, medium and large) in ordinal categories (< 100 individuals and between 101 and 1,000 ind.).

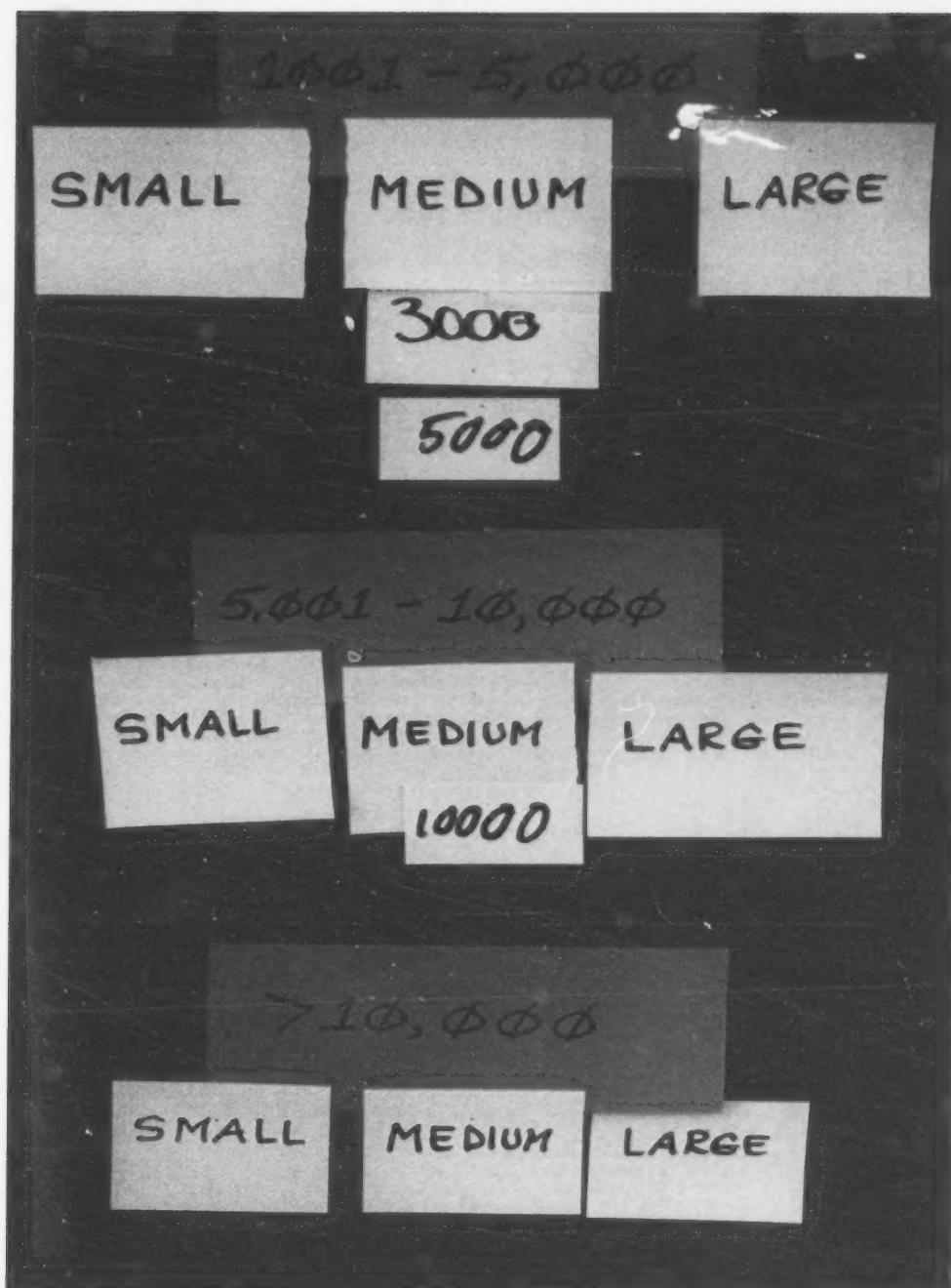


Figure C7: Participants estimated the total number of Striped Bass caught by year across three size categories (small, medium and large) in ordinal categories (between 1,001 and 5,000 ind. ; 5,001 and 10,000 ind. ; > 10,000 ind.).

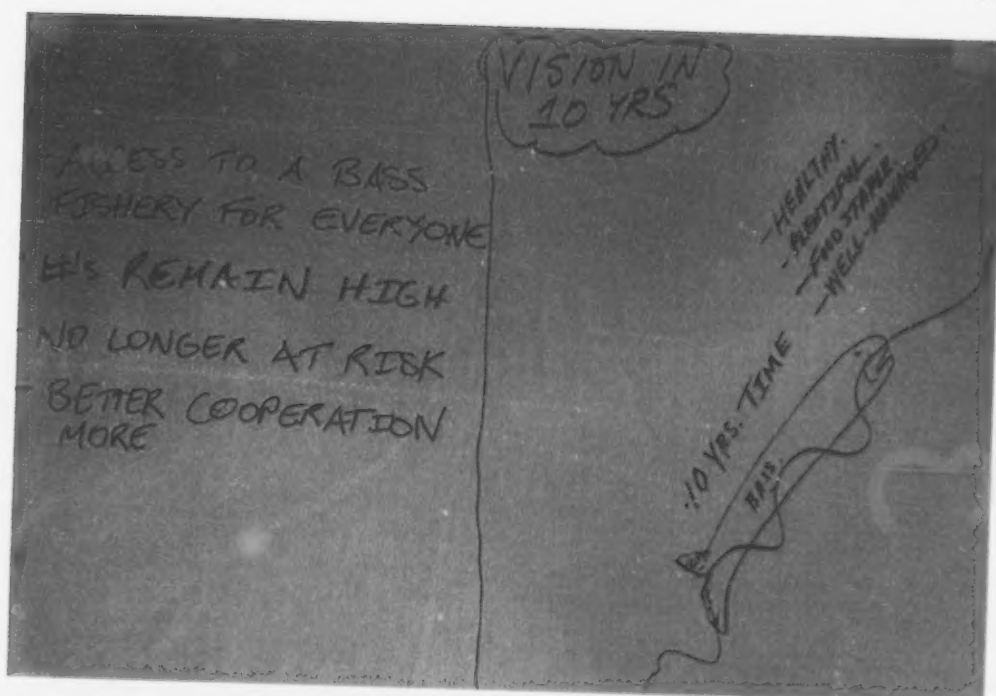


Figure C8. Participants vision of Striped Bass in 10 years.

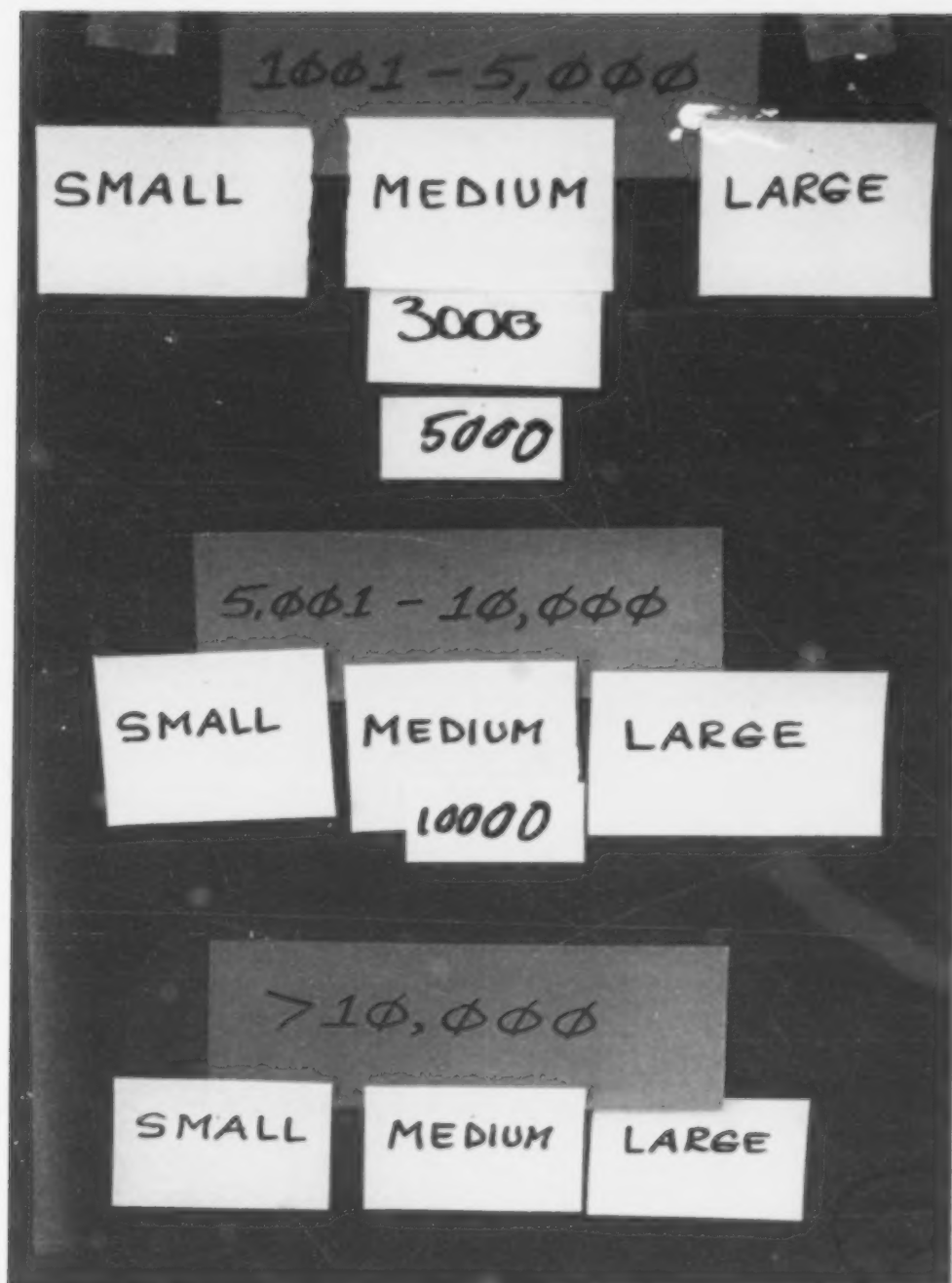


Figure C7: Participants estimated the total number of Striped Bass caught by year across three size categories (small, medium and large) in ordinal categories (between 1,001 and 5,000 ind. ; 5,001 and 10,000 ind. ; > 10,000 ind.).

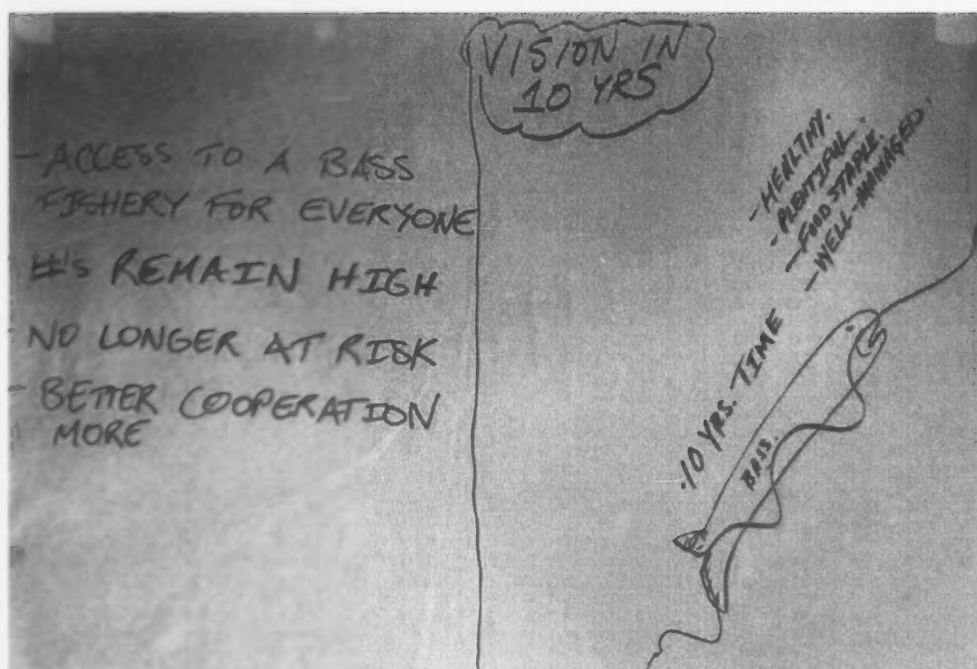


Figure C8. Participants vision of Striped Bass in 10 years.

Appendix D: Figures

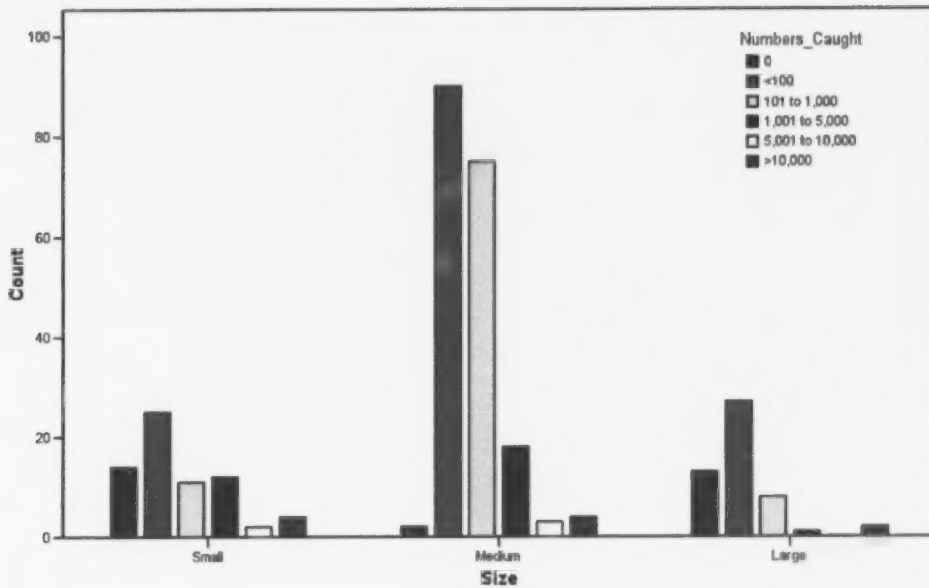


Figure D1: Count of the number of responses per category (0, <100, 101 to 1,000, 1,001 to 5,000, 5,001 to 10,000, >10,000), across three size categories of Striped Bass (small, medium and large), caught in all the fisheries identified in the questionnaire.

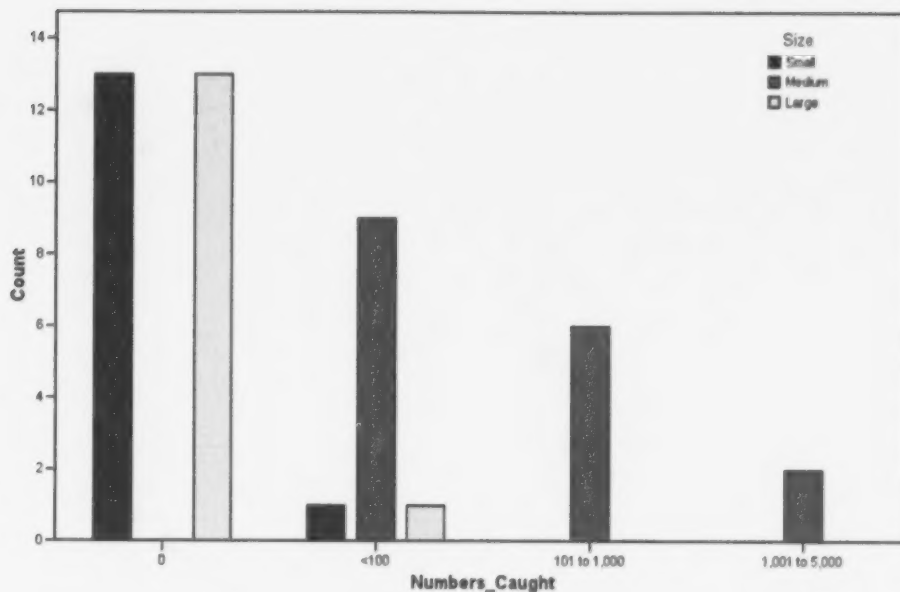


Figure D2: Count of the number of responses per category (0, <100, 101 to 1,000, 1,001 to 5,000, 5,000 to 10,000, >10,000), across three size categories of Striped Bass (small, medium and large), caught in the Aboriginal food, social and ceremonial (FSC) fishery for Atlantic Salmon with gillnets and trapnets.

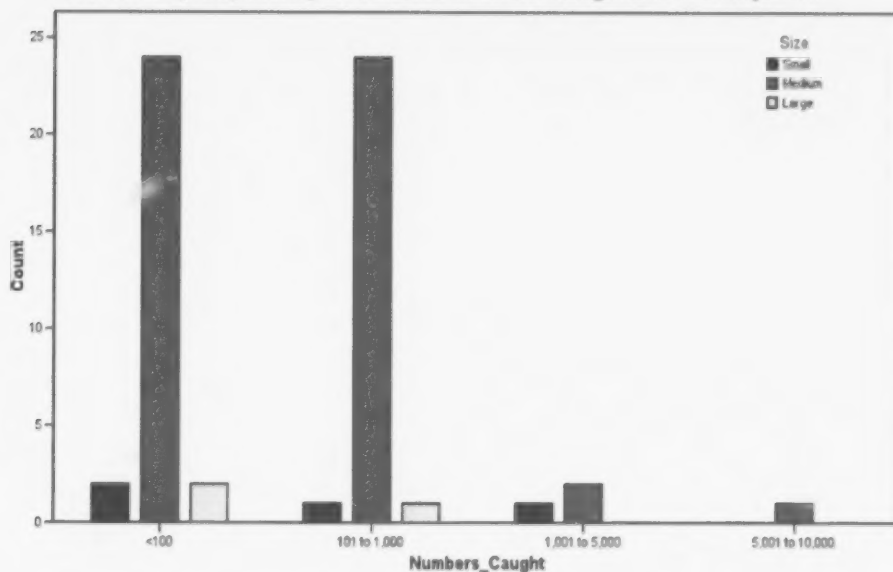


Figure D3: Count of the number of responses per category (0, <100, 101 to 1,000, 1,001 to 5,000, 5,000 to 10,000, >10,000), across three size categories of Striped Bass (small, medium and large), caught in tidal and marine recreational fishery.

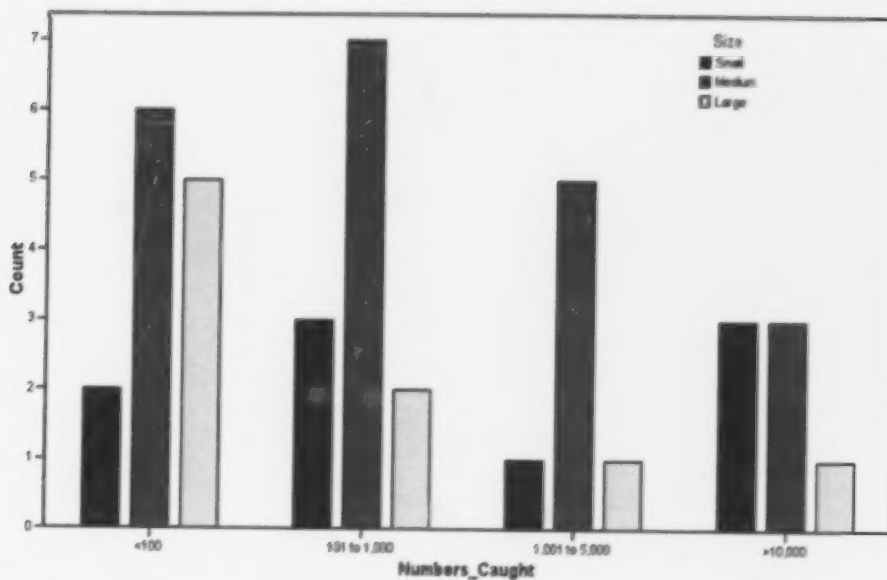


Figure D4: Count of the number of responses per category (0, <100, 101 to 1,000, 1,001 to 5,000, 5,000 to 10,000, >10,000), across three size categories of Striped Bass (small, medium and large), caught in the commercial Gaspereau fishery.

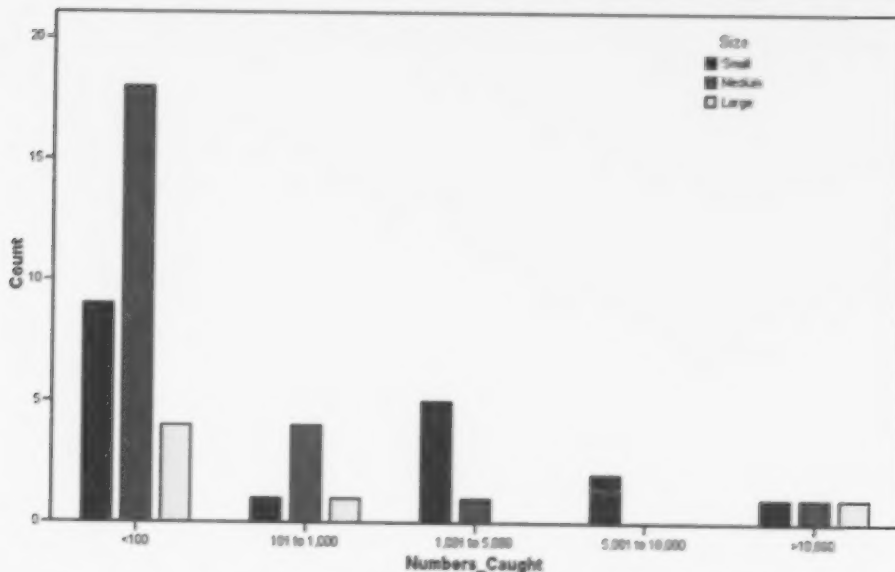


Figure D5: Count of the number of responses per category (0, <100, 101 to 1,000, 1,001 to 5,000, 5,000 to 10,000, >10,000), across three size categories of Striped Bass (small, medium and large), caught in the commercial Rainbow Smelt fishery.

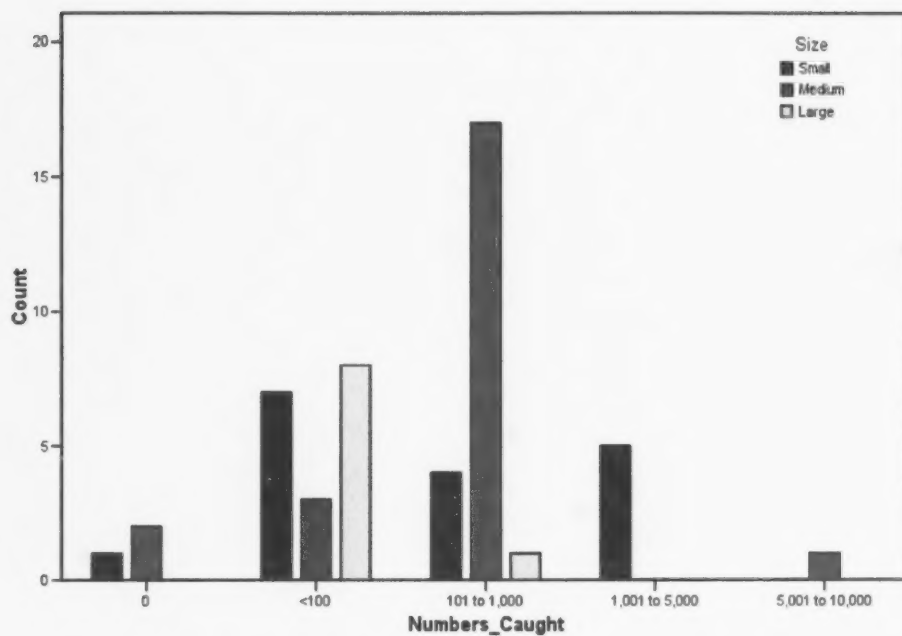


Figure D6: Count of the number of responses per category (0, <100, 101 to 1,000, 1,001 to 5,000, 5,000 to 10,000, >10,000), across three size categories of Striped Bass (small, medium and large), caught in the commercial American Eel fishery.

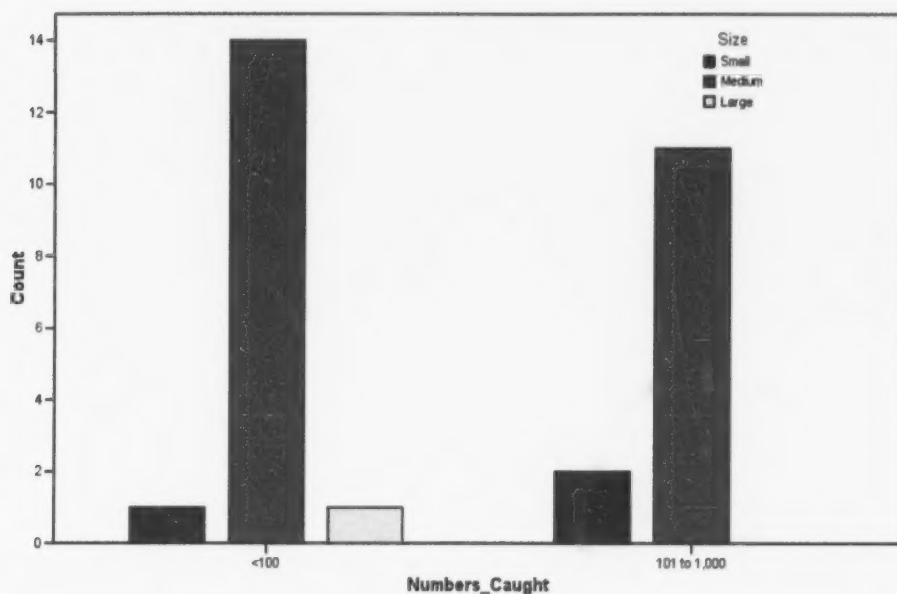


Figure D7: Count of the number of responses per category (0, <100, 101 to 1,000, 1,001 to 5,000, 5,000 to 10,000, >10,000), across three size categories of Striped Bass (small, medium and large), caught in the commercial Atlantic Herring fishery.

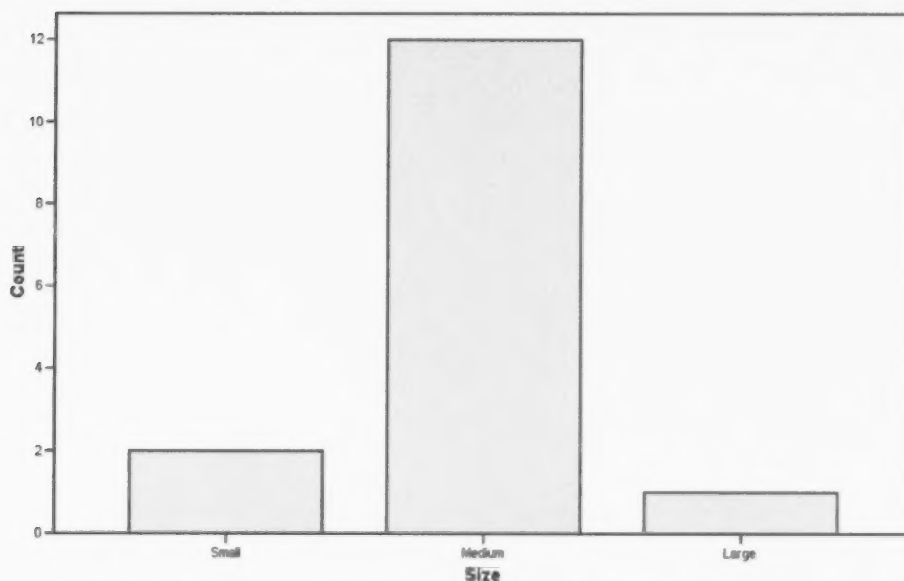


Figure D8: Count of the number of responses per category (0, <100, 101 to 1,000, 1,001 to 5,000, 5,000 to 10,000, >10,000), across three size categories of Striped Bass (small, medium and large), caught in the commercial Atlantic Silverside fishery.

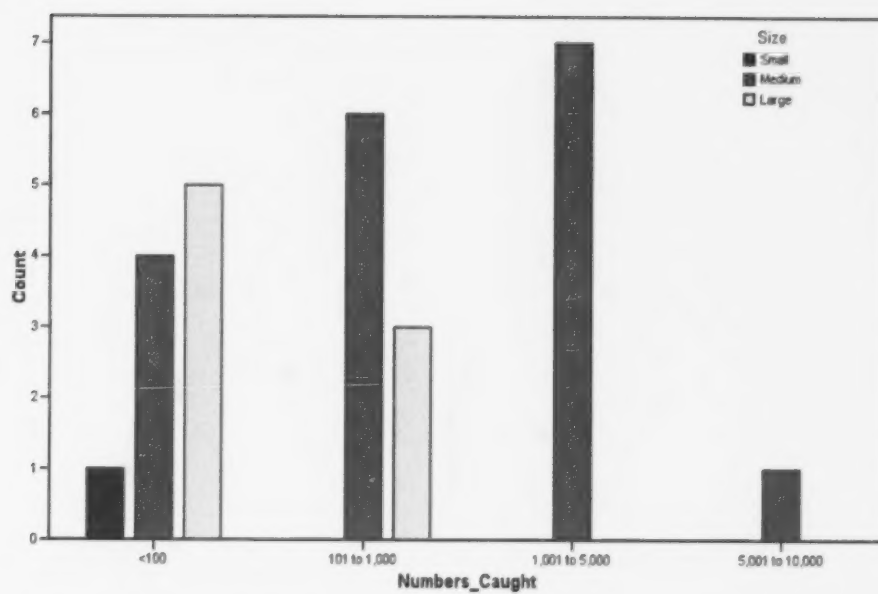


Figure D9: Count of the number of responses per category (0, <100, 101 to 1,000, 1,001 to 5,000, 5,000 to 10,000, >10,000), across three size categories of Striped Bass (small, medium and large), caught in the illegal fishery.

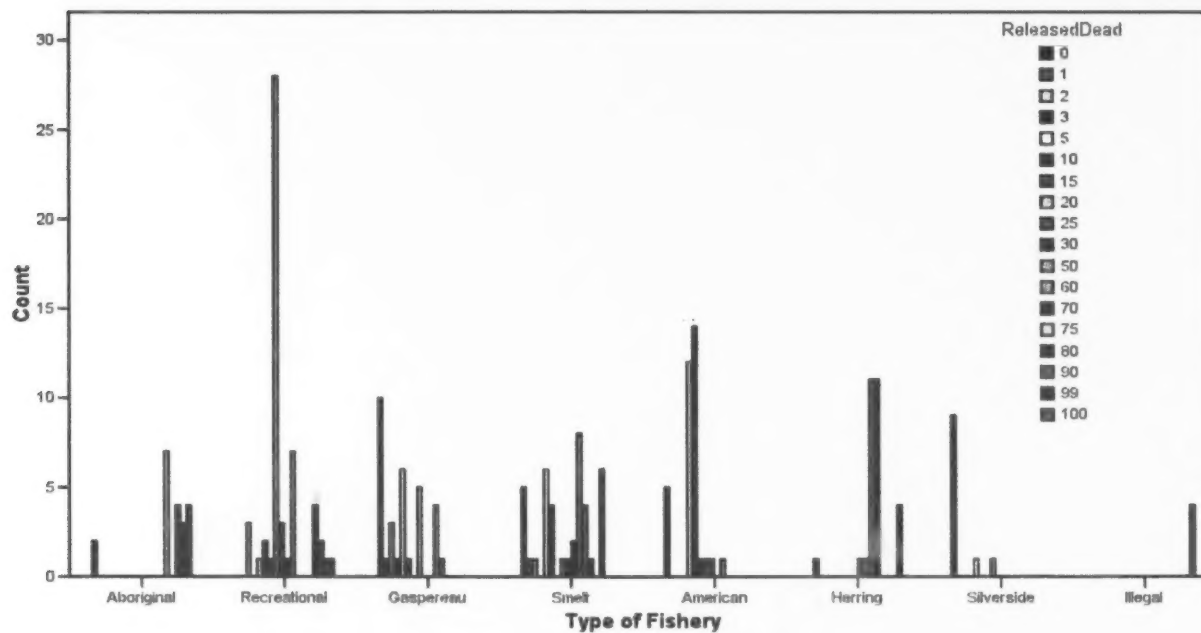


Figure D10: Count of the number of responses based on the percentage of Striped Bass caught and released dead by type of fishery.

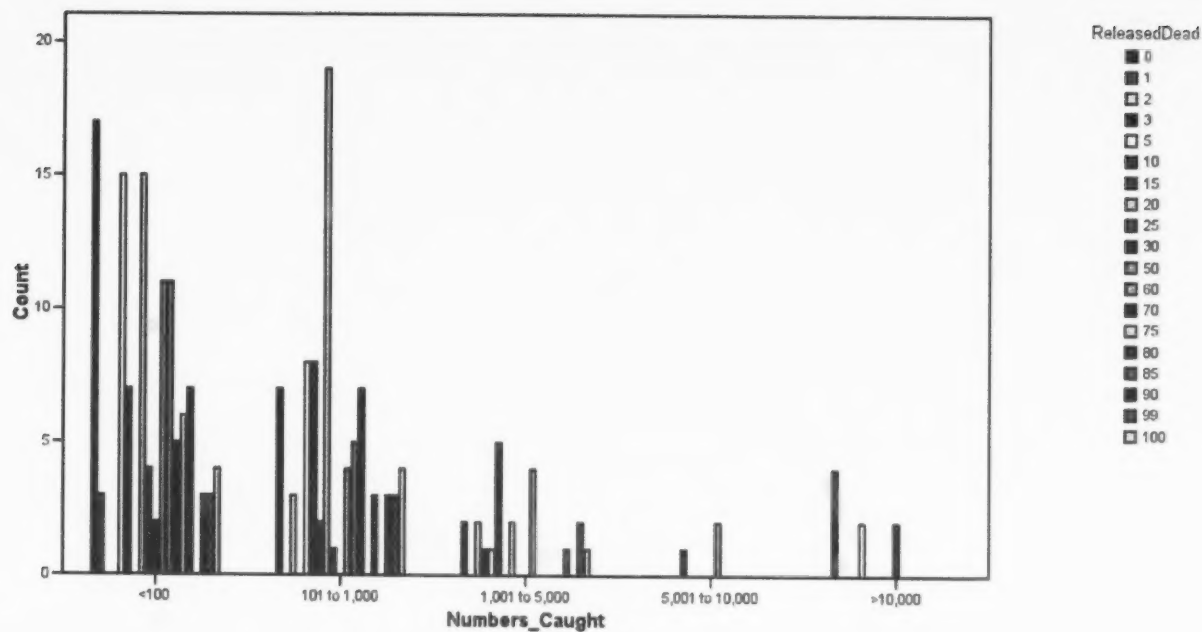


Figure D11: Count of the number of responses based on the percentage of Striped Bass caught in various fisheries and released dead across ordinal categories.

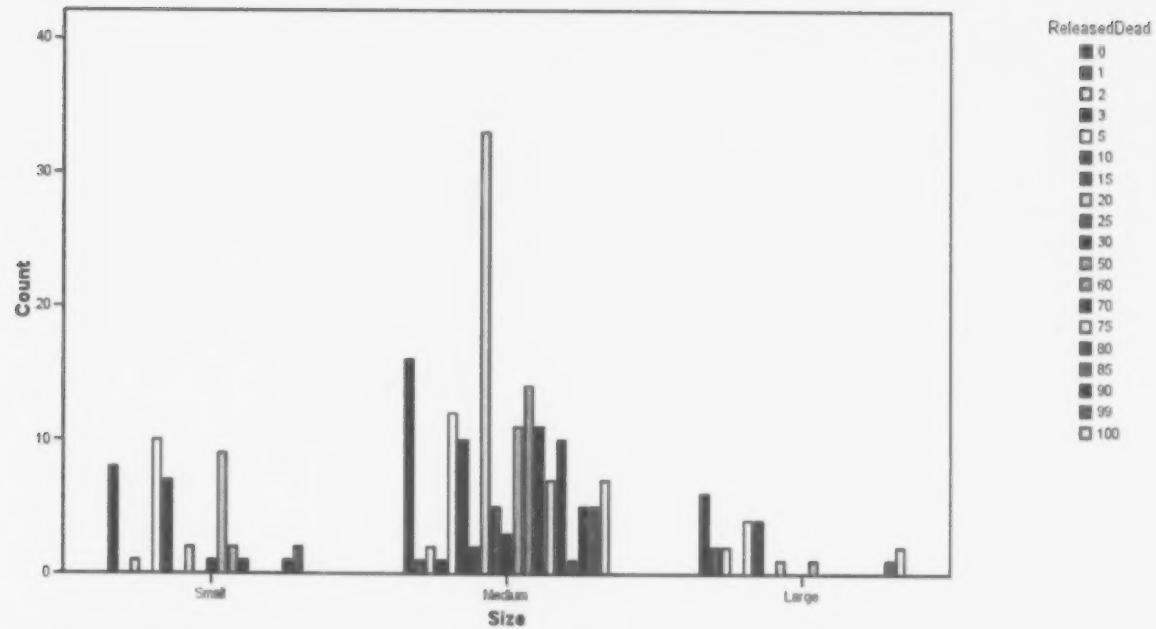


Figure D12: Count of the number of responses based on the percentage of Striped Bass Caught in various fisheries and released dead across size categories (small, medium and large).